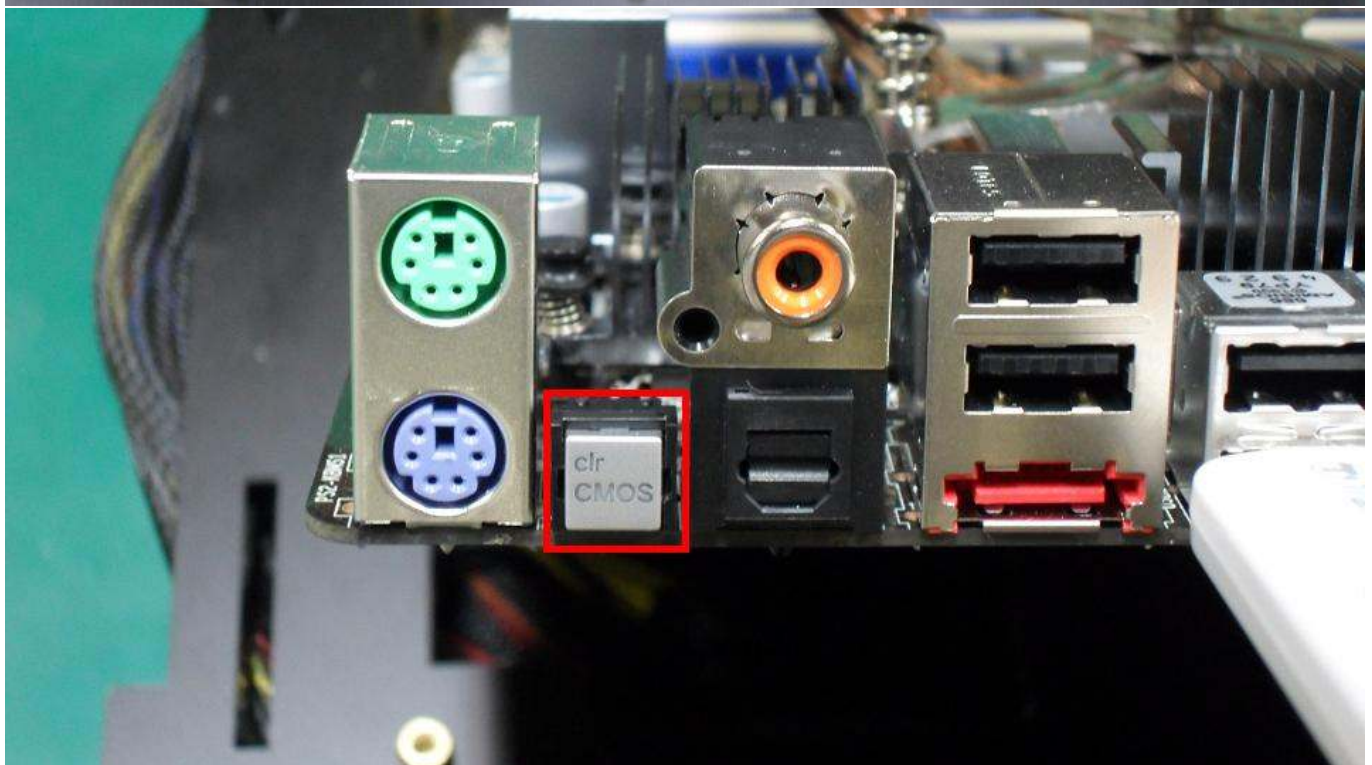


PRINCO DDR3-1800 user guide and testing for ASRock-P55M Motherboard

CPU i7-875 2.93G



Part I : Standard test

*It's the easiest way to enjoy overclock benefit by
using PRINCO DDR3-1800 DIMM board*

How to use?

0. Clear BIOS to mainboard initial setting
1. Enter BIOS setup and [OC Tweaker] menu



2. Enter [Load XMP Setting] item and choose X.M.P option

*BIOS will load X.M.P parameter in SPD on DIMM board ,
which are performance optimized for PRINCO DDR3-1800
DIMM board*

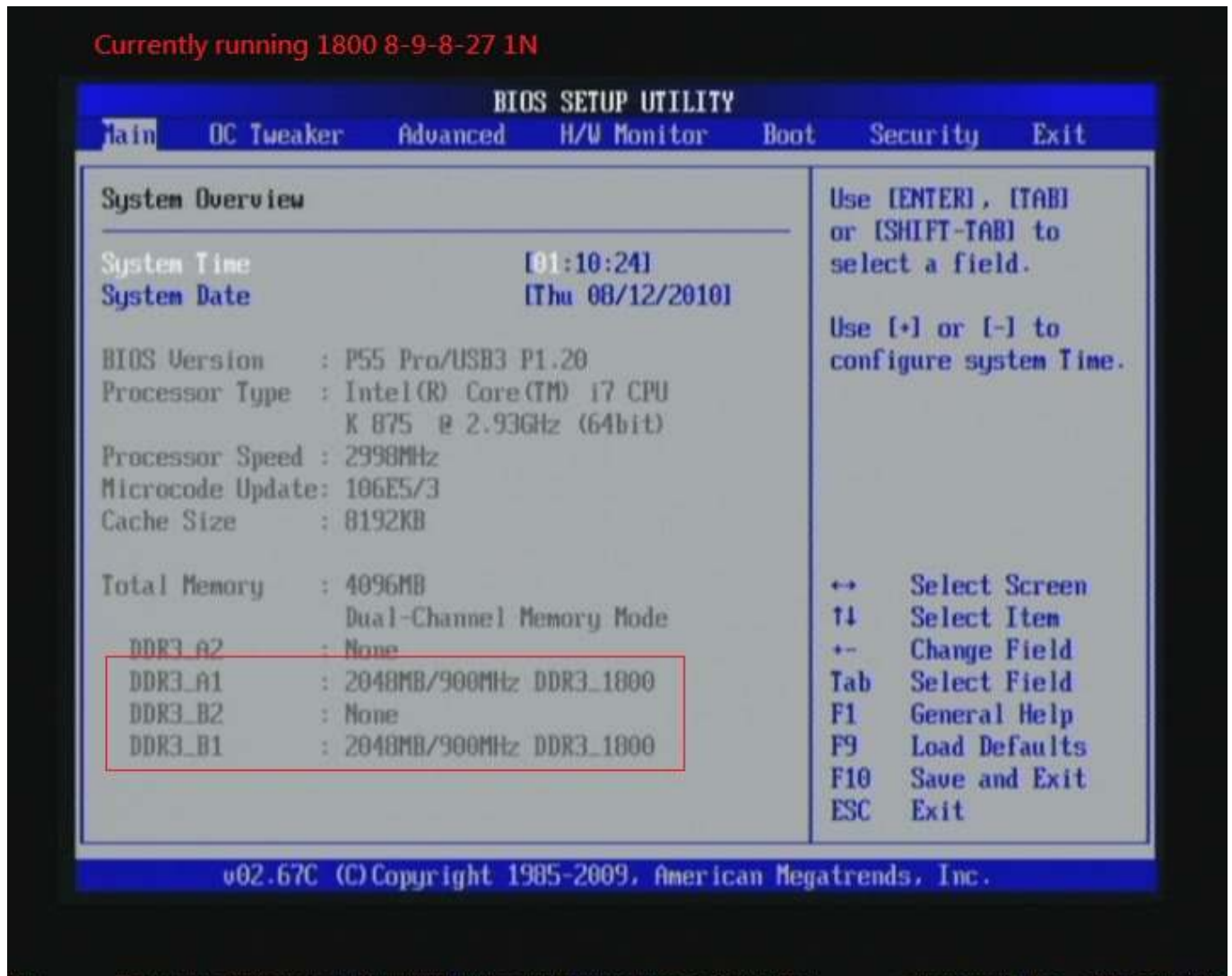
3. Enter [Load XMP Setting] item and select [Profile 2]



4. Save BIOS changes [F10] and exit



5. Enter BIOS setup and [Main] menu



Test result?

In order to demonstrate the performance and stability of PRINCO DDR3-1800 DIMM board, We use the strictest stress testing, that is, multi-core MemTest in window 7.

(Data rate : $900.0 * 2 = 1800$, timing : 8, 9, 8, 27, multi-core test => pass!)

The screenshot displays a Windows 7 desktop with multiple MemTest86 windows and CPU-Z utility windows. The MemTest86 windows show a test configuration of 430 MB of RAM and report 0 errors with coverage percentages ranging from 119.8% to 137.7%. The CPU-Z windows provide detailed system information:

- CPU-Z Processor:** Intel Core i7 875K, Lynnfield, Socket 1156 LGA, 45 nm technology, 1.080 V core voltage. Specification: Intel(R) Core(TM) i7 CPU K 875 @ 2.93GHz. Family 6, Model E, Stepping 5, Ext. Family 6, Ext. Model 1E, Revision B1. Instructions: MMX, SSE (1, 2, 3, 3S, 4.1, 4.2), EM64T, VT-x.
- CPU-Z Caches:** L1 Data: 4 x 32 KBytes (8-way), L1 Inst: 4 x 32 KBytes (4-way), Level 2: 4 x 256 KBytes (8-way), Level 3: 8 MBytes (16-way).
- CPU-Z Memory:** Type: DDR3, Size: 4096 MBytes, Channels #: Dual, DC Mode, NB Frequency: 2699.9 MHz.
- CPU-Z Timings:** DRAM Frequency: 900.0 MHz, FSB-DRAM: 2:12, CAS# Latency (CL): 8.0 clocks, RAS# to CAS# Delay (tRCD): 9 clocks, RAS# Precharge (tRP): 8 clocks, Cycle Time (tRAS): 27 clocks, Row Refresh Cycle Time (tRFC): 98 clocks, Command Rate (CR): 1T.
- CPU-Z Memory Slot Selection:** Slot #1: DDR3, Module Size: 2048 MByte, Max Bandwidth: PC3-10700 (6670), Part Number: PRINCO-DR3-1800, Serial Number.
- CPU-Z Timings Table:** JEDEC #3: 609 MHz, JEDEC #3: 6670, CAS# Latency: 8.0, RAS# to CAS#: 8, RAS# Precharge: 8, tRAS: 22, tRC: 30, Command Rate: 1T, Voltage: 1.50 V.

The Windows 7 taskbar shows the task manager with CPU usage at 100% and memory usage at 3.74 GB.

Advanced Overclocking and Testing

Part II : Heavy test

If you want to know the potential of PRINCO DDR3-1800? Following are step-by-step howto.

How to use?

0. Clear BIOS to mainboard initial setting
1. Enter BIOS setup and [OC Tweaker] menu



2. Enter [Overclock Mode] item and select Manual
3. Select [BLCK Frequency] item , and increase to higher Base clock rate (ex:164). Then select [DRAM Frequency] item , and set the DDR3 memory to higher clock rate (ex:DDR3-1968). Don't forget setting [CPU Ratio Setting] item to suitable ratio [ex:17]
(In this case we only focus on memory over clocking, not CPU)
4. Select [DRAM Voltage] item , and set the value to [1.643V].

Step 1 : Overclock Mode

Set [Manual]

Step 2 : BCLK Frequency (MHz)

Set [164]

Step 3 : CPU Ratio Setting

Set [17]

Step 4 : DRAM Frequency

Set [984MHz DDR3_1968]

Step 5 : DRAM Voltage

Set [1.643V]

BIOS SETUP UTILITY

Main **OC Tweaker** Advanced H/W Monitor Boot Security Exit

Good Night LED	[Disabled]		▲ Standard = 1.615V Max = 2.008V
Overclock Mode	[Manual]	Step 1	
BCLK Frequency (MHz)	[164]	Step 2	
PCIE Frequency (MHz)	[100]		
Boot Failure Guard	[Enabled]		
Boot Failure Guard Count	[3]		
Spread Spectrum	[Auto]		
CPU Ratio Setting	17 [17]	Step 3	
QPI Frequency	5.9046T [Auto]		
DRAM Frequency	DDR3_1968 [984MHz DDR3_1968]	Step 4	
▶ DRAM Timing Control			
ASRock UDrop Control	[With UDrop]		
CPU Voltage	[Auto]		
DRAM Voltage	1.643V [1.643V]	Step 5	
UT Voltage	1.309V [Auto]		
PCH Voltage	1.079V [Auto]		

System may be damaged or reduce its life cycle when overvoltage.

↔ Select Screen
↑↓ Select Item
←→ Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit

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5. Enter [DRAM Timing Control] item

Select " DRAM Timing Control "

The image shows a BIOS Setup Utility screen with the following layout:

- BIOS SETUP UTILITY** (Title)
- Navigation tabs: **Main**, **DC Tweaker**, **Advanced**, **H/W Monitor**, **Boot**, **Security**, **Exit**
- Configuration items (left side):
 - Good Night LED [Disabled]
 - Overclock Mode [Manual]
 - BCLK Frequency (MHz) [164]
 - PCIe Frequency (MHz) [100]
 - Boot Failure Guard [Enabled]
 - Boot Failure Guard Count [3]
 - Spread Spectrum [Auto]
 - CPU Ratio Setting 17 [17]
 - QPI Frequency 5.904GT [Auto]
 - DRAM Frequency DDR3_1968 [984MHz DDR3_1968]
 - ▶ DRAM Timing Control** (highlighted with a red box)
 - ASRock UDroop Control [With UDroop]
 - CPU Voltage [Auto]
 - DRAM Voltage 1.643V [1.643V]
 - UTT Voltage 1.309V [Auto]
 - PCH Voltage 1.079V [Auto]
- Help/Navigation (right side):
 - All DRAM Timing Control.
 - ←→ Select Screen
 - F4 Select Item
 - Enter Go to Sub Screen
 - F1 General Help
 - F9 Load Defaults
 - F10 Save and Exit
 - ESC Exit
- Footer: u02.67C (C) Copyright 1985-2009, American Megatrends, Inc.

6. set [DRAM tCL] item to [8]

set [DRAM tRCD] item to [9]

set [DRAM tRP] item to [8]

set [DRAM tRAS] item to [27]

set [DRAM Command Rate] item to [1]

Step 1 : DRAM tCL Set [8]
DRAM tRCD Set [9]
DRAM tRP Set [8]
DRAM tRAS Set [27]
Step 2 : DRAM Command Rate Set [1]

Chipset Settings

JC Tweaker

DRAM Timing Control

DRAM tCL	7	[8]	Step 1
DRAM tRCD	9	[9]	
DRAM tRP	7	[8]	
DRAM tRAS	24	[27]	
DRAM tRFC	88	[Auto]	
DRAM tWR	12	[Auto]	
DRAM tWTR	6	[Auto]	
DRAM tRRD	5	[Auto]	
DRAM tRTP	4	[Auto]	
DRAM tFAW	24	[Auto]	
DRAM CHA RTL	42	[Auto]	
DRAM CHB RTL	43	[Auto]	
DRAM tWL	8	[Auto]	
DRAM RttNom	60	[Auto]	
DRAM RttWr	Disabled	[Auto]	
DRAM PD Exit Mode	Slow	[Auto]	
DRAM B2B CAS Delay	Disabled	[Auto]	
DRAM Command Rate		[1]	Step 2

Specifies the Command/Address rate.

↔ Select Screen
↑↓ Select Item
←→ Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit

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7. Save BIOS changes [F10] and exit



Ps: after reboot , check if the new setup have been updated.

Currently running 1968 8-9-8-27 1N

BIOS SETUP UTILITY

Main OC Tweaker Advanced H/W Monitor Boot Security Exit

System Overview

System Time [02:12:37]
System Date [Thu 08/12/2010]

BIOS Version : P55 Pro/USB3 P1.20
Processor Type : Intel(R) Core(TM) i7 CPU
K 875 @ 2.93GHz (64bit)
Processor Speed : 2787MHz
Microcode Update: 106E5/3
Cache Size : 8192KB

Total Memory : 4096MB
Dual-Channel Memory Mode

DDR3_A2 : None
DDR3_A1 : 2048MB/984MHz DDR3_1968
DDR3_B2 : None
DDR3_B1 : 2048MB/984MHz DDR3_1968

Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Use [+] or [-] to configure system Time.

↔ Select Screen
↑↓ Select Item
←→ Change Field
Tab Select Field
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit

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Test result?

We use the strictest stress testing, multi-core MemTest in window 7, to show you PRINCO DDR3-1800 potential.

(Data rate : $983.9 \times 2 = 1967$, timing : 8, 9, 8, 27, multi-core test => pass!)

The image displays a collage of software windows. On the left, eight instances of MemTest are shown in a grid, each reporting 0 errors and various coverage percentages (e.g., 117.9%, 122.7%, 118.6%, 119.9%, 119.0%, 116.6%, 118.8%, 110.0%). The MemTest windows have a text input field set to '430' and buttons for 'Start Testing', 'Stop Testing', and 'About MemTest'. Below the MemTest windows, a Windows Task Manager window is visible, showing 'CPU 使用率' at 100% and '記憶體' at 3.75 GB. On the right side, four instances of CPU-Z are shown. The top two CPU-Z windows display the processor information for an Intel Core i7 875K, including details like Lynnfield, Socket 1156 LGA, and 45 nm technology. The bottom two CPU-Z windows show the memory configuration, including DDR3, 4096 MBytes, Dual Channels, and a DRAM Frequency of 983.9 MHz. The CPU-Z windows also show a 'Validate' button and 'OK' button.

Part III : Advance test

If you set parameter in BIOS as below ,

Overclock Mode : [manual]

BCLK frequency(Mhz) : [171]

CPU Ratio Setting : [17]

DRAM Frequency : [1026Mhz DDR3_2052]

CPU Voltage : [Auto]

VTT Voltage : [Auto]

DRAM Voltage : [1.643V]

DRAM timing : 9, 9, 9, 27

you can check next page

(Data rate : $1028 * 2 = 2056$, timing : 9, 9, 9, 27 , multi-core test =>

pass!)

Four instances of MemTest86 are shown, each testing 430 MB of RAM. All tests show 0 errors and coverage percentages ranging from 111.6% to 126.8%.

Each instance includes a "Start Testing" button, a "Stop Testing" button, and an "About MemTest" button. A message at the bottom of each window reads: "If you find the free version useful, please considering purchasing the PRO (\$5) or Deluxe (\$14) versions, which add additional features."

Summary of MemTest86 results:

Instance	Coverage	Errors
1	127.2%	0
2	125.1%	0
3	124.0%	0
4	126.8%	0
5	125.0%	0
6	111.6%	0

CPU-Z Version 1.56

CPU | Caches | Mainboard | Memory | SPD | Graphics | About

Processor

- Name: Intel Core i7 875K
- Code Name: Lynnfield
- Package: Socket 1156 LGA
- Technology: 45 nm
- Core Voltage: 1.000 V
- Specification: Intel(R) Core(TM) i7 CPU K 875 @ 2.93GHz
- Family: 6
- Model: E
- Stepping: 5
- Ext. Family: 6
- Ext. Model: 1E
- Revision: B1
- Instructions: MMX, SSE (1, 2, 3, 3S, 4.1, 4.2), EM64T, VT-x

Clocks (Core #0)

- Core Speed: 2912.7 MHz
- Multiplier: x 17.0
- Bus Speed: 171.3 MHz
- QPI Link: 3084.0 MHz

Cache

- L1 Data: 4 x 32 KBytes (8-way)
- L1 Inst: 4 x 32 KBytes (4-way)
- Level 2: 4 x 256 KBytes (8-way)
- Level 3: 8 MBytes (16-way)

Selection: Processor #1 | Cores: 4 | Threads: 8

Buttons: Validate, OK

CPU-Z Version 1.56

CPU | Caches | Mainboard | Memory

Motherboard

- Manufacturer: ASRock
- Model: P55 Pro/USB3
- Chipset: Intel
- Southbridge: Intel
- LPCIO: Nuvoton

BIOS

- Brand: American Megatrends
- Version: P1.20
- Date: 08/12/2010

Graphic Interface

- Version:
- Link Width: x16
- Side Band:

Buttons: Validate, OK

CPU-Z Version 1.56

CPU | Caches | Mainboard | Memory | SPD | Graphics | About

General

- Type: DDR3
- Size: 4096 MBytes
- Channels #: Dual
- DC Mode:
- NB Frequency: 3084.0 MHz

Timings

- DRAM Frequency: 1028.0 MHz
- FSB-DRAM: 2:12
- CAS# Latency (CL): 9.0 clocks
- RAS# to CAS# Delay (tRCD): 9 clocks
- RAS# Precharge (tRP): 9 clocks
- Cycle Time (tRAS): 27 clocks
- Row Refresh Cycle Time (tRFC): 98 clocks
- Command Rate (CR): 1T
- DRAM Idle Timer:
- Total CAS# (tRDRAM):
- Row To Column (tRCD):

Buttons: Validate, OK

CPU-Z Version 1.56

CPU | Caches | Mainboard | Memory

Memory Slot Selection

- Slot #1: DDR3
- Module Size: 2048 MByte
- Max Bandwidth: PC3-10700 (6670)
- Manufacturer:
- Part Number: PRINCO-DR3-18
- Serial Number:

Timings Table

	JEDEC #3	JEDEC #4
Frequency	609 MHz	667 MHz
CAS# Latency	8.0	8.0
RAS# to CAS#	8	8
RAS# Precharge	8	8
tRAS	22	22
tRC	30	30
Command Rate		
Voltage	1.50 V	1.50 V

Buttons: Validate, OK

Windows 工作管理員

檔案(F) 選項(O) 檢視(V) 說明(H)

應用程式 | 處理程序 | 服務 | 效能 | 網路功能 | 使用者

CPU 使用率

100 %

記憶體

3.73 GB

CPU 使用率記錄

實體記憶體使用記錄