

PRINCO DDR3-1800 user guide and testing for ASRock-H55M-LE Motherboard

CPU i3-540 3.07G



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 select [Profile 2]

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

3. Enter [QPI Frequency] item and select [Auto]

Step 1 : Select " OC Tweaker "

Step 2 : Load XMP Setting

Set [Profile 2]

Step 3 : QPI Frequency

Set [AUTO]

BIOS SETUP UTILITY

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

Step 1

Turbo 50	[Press Enter]	
Load CPU EZ OC Setting	[Press Enter]	
Load Memory EZ OC Setting	[Press Enter]	
Load GPU EZ OC Setting	[Press Enter]	
Load XMP Setting	[Profile 2]	Step 2
Profile 1 : DDR3 1600 7-9-7-24 1.60V		
Profile 2 : DDR3 1800 8-9-8-27 1.60V		
Intelligent Energy Saver	[Disabled]	
Good Night LED	[Disabled]	
Overclock Mode	[Manual]	↔ Select Screen
BCLK Frequency (MHz)	[180]	↑ Select Item
Boot Failure Guard	[Enabled]	+ - Change Option
Boot Failure Guard Count	[3]	F1 General Help
Spread Spectrum	[Auto]	F9 Load Defaults
CPU Ratio Setting	17 [17]	F10 Save and Exit
QPI Frequency	7.920GT [Auto]	ESC Exit

Transition the links to the specified speed when transitioning the links to full-speed. (if supported by all components)

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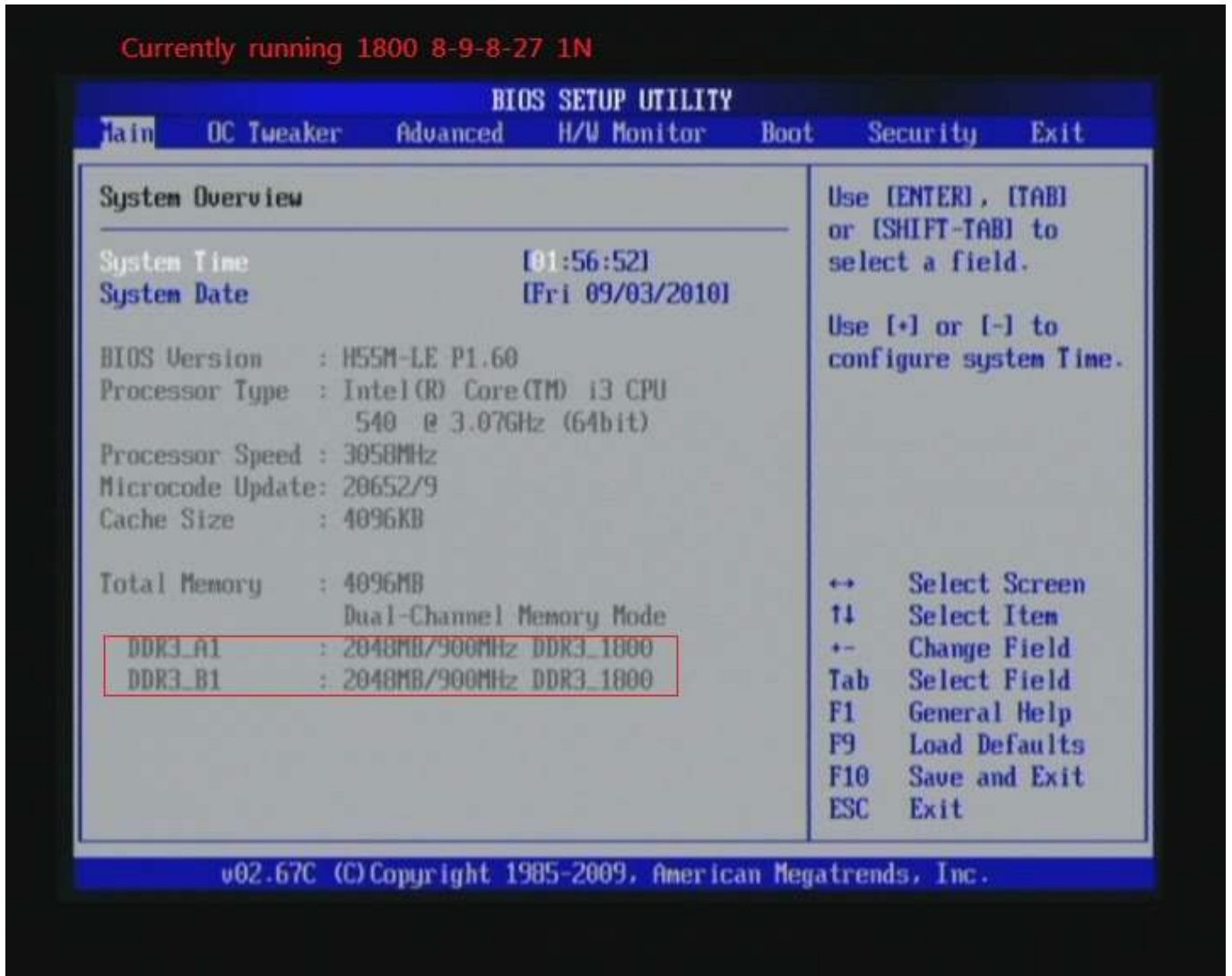
4. Save BIOS changes [F10] and exit

Press the Keyboard "F10"

Save configuration changes and exit setup?



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



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 : 899.9Mhz*2, timing : 8, 9, 8, 27, multi-core test => pass!)

Four MemTest86 windows showing test results. Each window displays '0 Errors' and a coverage percentage: 106.6%, 106.7%, 106.2%, and 113.9%. The input field for RAM size is set to 870 MB. The status bar at the bottom shows 'CPU 使用率: 100%' and '實體記憶體: 93%'.

CPU-Z window showing processor details for Intel Core i3 540. Processor Name: Intel Core i3 540, Code Name: Clarkdale, Brand ID: Intel, Package: Socket 1156 LGA, Technology: 32 nm, Core Voltage: 1.256 V. Specification: Intel(R) Core(TM) i3 CPU 540 @ 3.07GHz. Family: 6, Model: 5, Stepping: 2, Ext. Family: 6, Ext. Model: 25, Revision: C2. Instructions: MMX, SSE (1, 2, 3, 3S, 4.1, 4.2), EM64T, VT-x. Clocks (Core #0): Core Speed: 3059.5 MHz, Multiplier: x 17.0, Bus Speed: 180.0 MHz, QPI Link: 3959.4 MHz. Cache: L1 Data: 2 x 32 KBytes 8-way, L1 Inst: 2 x 32 KBytes 4-way, Level 2: 2 x 256 KBytes 8-way, Level 3: 4 MBytes 16-way. Selection: Processor #1, Cores: 2, Threads: 4.

CPU-Z window showing motherboard details for ASRock H55M-LE. Manufacturer: ASRock, Model: H55M-LE, Chipset: Intel, Southbridge: Intel, LPCIO: Winbond. BIOS: Brand: American Megatrends, Version: P1.60, Date: 09/01/2010. Graphic Interface: Version, Link Width: x16, Side Band.

CPU-Z window showing memory details for DDR3 4096 MBytes. Type: DDR3, Channels #: Dual, DC Mode: Symmetric, NB Frequency: 2879.5 MHz. Timings: DRAM Frequency: 899.9 MHz, FSB:DRAM: 4:20, 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): 88 clocks, Command Rate (CR): 1T. DRAM Idle Timer, Total CAS# (tRDRAM), Row To Column (tRCD).

CPU-Z window showing memory slot selection and JEDEC #3 timings table. Memory Slot Selection: Slot #1, DDR3, Module Size: 2048 MB, Max Bandwidth: PC3-10700, Manufacturer: PRINCO, Part Number: PRINCO-DR3, Serial Number. Timings Table: JEDEC #3, Frequency: 609 MHz, CAS# Latency: 8.0, RAS# to CAS#: 8, RAS# Precharge: 8, tRAS: 22, tRC: 30, Command Rate: 1.50 V.

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:190). Then select [DRAM Frequency] item , and set the DDR3 memory to higher clock rate (ex:DDR3-1900).
4. Don't forget setting [CPU Ratio Setting] item to suitable ratio [ex:16]

(In this case we only focus on memory over clocking, not CPU)

Step 1: Select " OC Tweaker "

Step 2: Overclock Mode

BCLK Frequency (MHz)

Step 3: DRAM Frequency

Step 4: CPU Ratio Setting

Set [Manual]

Set [190]

Set [950MHz DDR3_1900]

Set [16]

BIOS SETUP UTILITY

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

Turbo 50 **Step 1** [Press Enter] ▲ Sets the ratio between CPU Core Clock and the FSB Frequency.

Load CPU EZ OC Setting [Press Enter]

Load Memory EZ OC Setting [Press Enter]

Load GPU EZ OC Setting [Press Enter]

Load XMP Setting [Default]

Profile 1 : DDR3 1600 7-9-7-24 1.60V

Profile 2 : DDR3 1800 8-9-8-27 1.60V

Intelligent Energy Saver [Disabled]

Good Night LED [Disabled]

Overclock Mode [Manual] **Step 2**

BCLK Frequency (MHz) [190]

Boot Failure Guard [Enabled]

Boot Failure Guard Count [3]

Spread Spectrum [Auto]

CPU Ratio Setting 16 [16] **Step 4**

QPI Frequency 8.360GT [Auto]

DRAM Frequency DDR3_1900 [950MHz DDR3_1900] **Step 3**

↔ Select Screen

↑↓ Select Item

+ - Change Option

F1 General Help

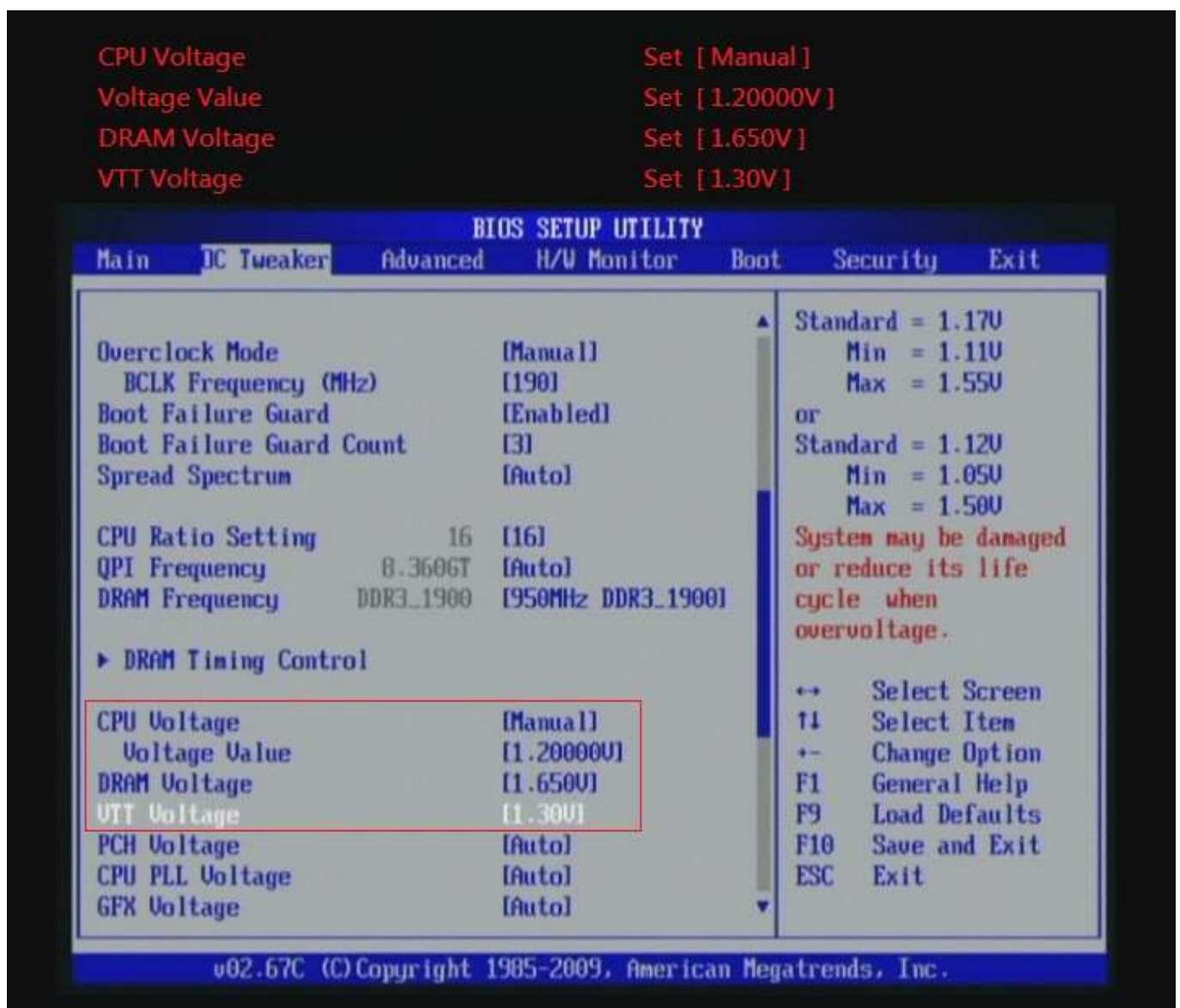
F9 Load Defaults

F10 Save and Exit

ESC Exit

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5. Select [CPU Voltage] item , and set [Manual].
6. Select [Voltage Value] item , and set the value to [1.20000V].
7. Select [DRAM Voltage] item , and set the value to [1.650V].
8. Select [VTT Voltage] item , and set the value to [1.30V].



9. Enter [DRAM Timing Control] item

Select " DRAM Timing Control "



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

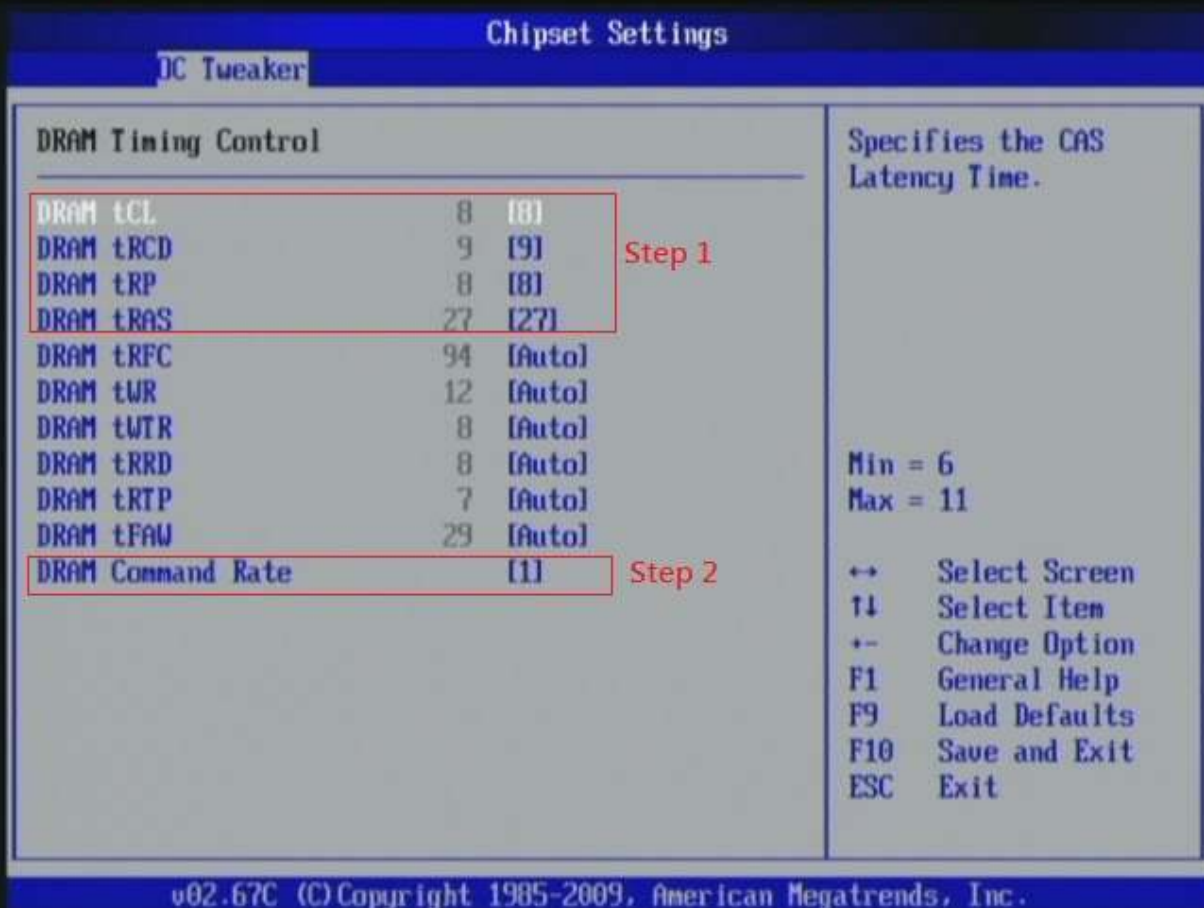
set [DRAM tRCD] item to [9]

set [DRAM tRP] item to [8]

set [DRAM tRAS] item to [27]

set [DRAM Command Rate] item to [1]

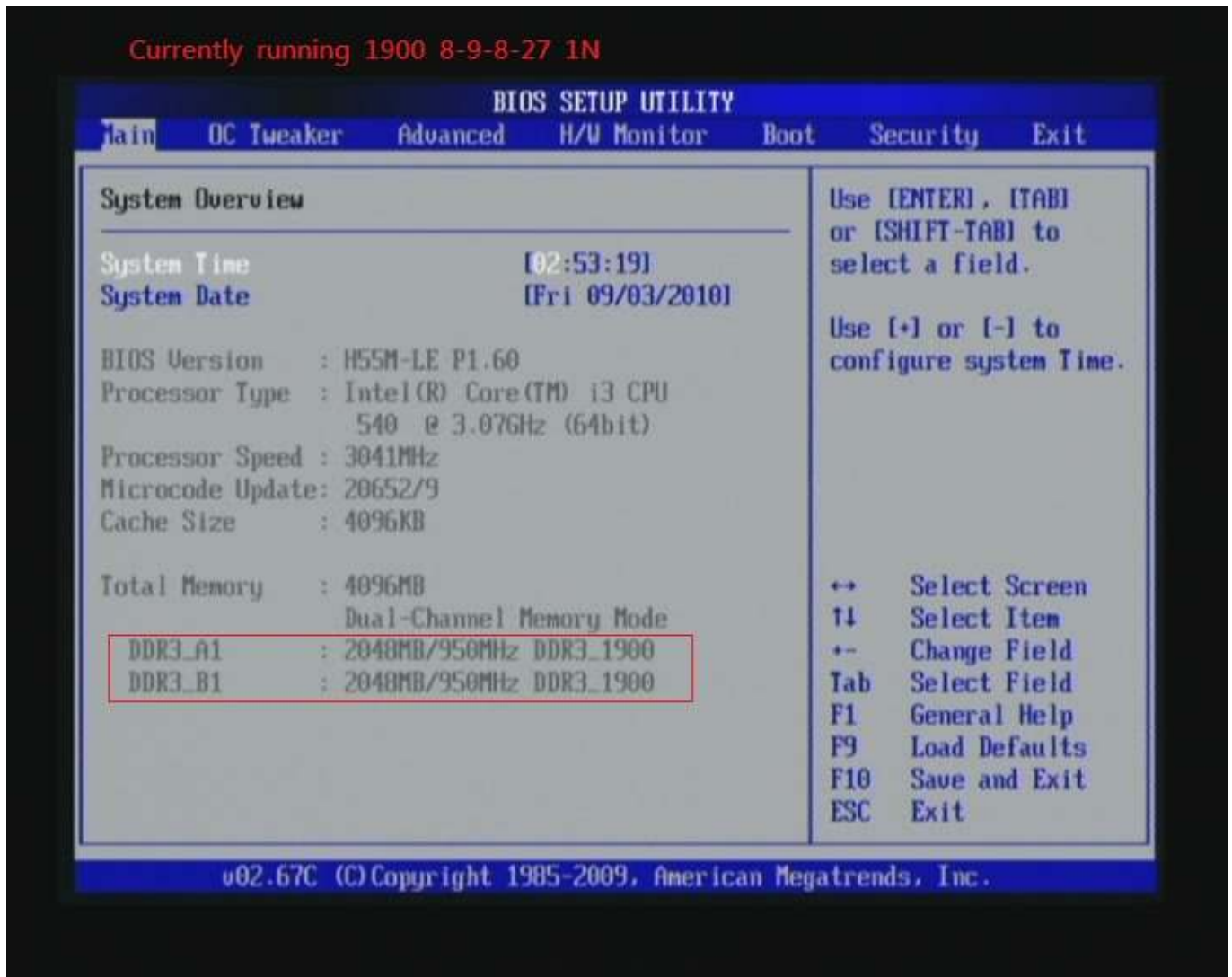
Step 1 : DRAM tCL Set [8]
DRAM tRCD Set [9]
DRAM tRP Set [8]
DRAM tRAS Set [27]
Step 2 : DRAM Command Rate Set [1]



11. Save BIOS changes [F10] and exit



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



Test result?

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

(Data rate : 950.6*2, timing : 8, 9, 8, 27, multi-core test => pass!)

Four MemTest86 windows are shown, each reporting 0 errors and high coverage percentages: 114.9%, 112.3%, 116.7%, and 132.6%. The RAM size tested is 870 MB. The interface includes 'Start Testing', 'Stop Testing', and 'About MemTest' buttons.

CPU-Z window showing processor details for an Intel Core i3 540. The processor is identified as Intel Core i3 540, Clarkdale, Socket 1156 LGA, 32 nm technology, with a core voltage of 1.168 V. The specification is Intel(R) Core(TM) i3 CPU 540 @ 3.07GHz. The clock speed is 3041.9 MHz, multiplier is x 16.0, bus speed is 190.1 MHz, and QPI link speed is 4182.6 MHz. The cache configuration is 2 x 32 KBytes L1 Data, 2 x 32 KBytes L1 Inst., 2 x 256 KBytes Level 2, and 4 MBytes Level 3. The selection is Processor #1, with 2 cores and 4 threads.

CPU-Z window showing motherboard details for an ASRock H55M-LE. The manufacturer is ASRock, model is H55M-LE, chipset is Intel, southbridge is Intel, and LPCIO is Winbond. The BIOS brand is American Megatrends, version is P1.60, and date is 09/01/2010. The graphic interface version is x16.

CPU-Z window showing memory details for DDR3 4096 MBytes. The memory type is DDR3, size is 4096 MBytes, channels are dual, and DC mode is symmetric. The NB frequency is 3042.0 MHz. The timings table shows: DRAM Frequency 950.6 MHz, FSB:DRAM 4:20, 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) 94 clocks, and Command Rate (CR) 1T.

CPU-Z window showing memory slot selection and JEDEC #3 timings. The memory slot selection is Slot #1, DDR3, 2048 MB, max bandwidth PC3-10700 (6), manufacturer PRINCO, part number PRINCO-DR3-. The JEDEC #3 timings table shows: Frequency 609 MHz, CAS# Latency 8.0, RAS# to CAS# 8, RAS# Precharge 8, tRAS 22, tRC 30, Command Rate 1.50 V.

Windows Task Manager window showing system performance. The CPU usage is 100%, and the memory usage is 93%. The system information shows 4087 MB total memory, 276 MB free, and 265 MB available. The system is running on a 7991 MHz processor with 33 processes and 3994 / 8172 MB of memory.

Part III : Advance test

If you set parameter in BIOS as below ,

Overclock Mode : [manual]

BCLK frequency(Mhz) : [195]

CPU Ratio Setting : [15]

DRAM Frequency : [975Mhz DDR3_1950]

CPU Voltage : [1.200V]

VTT Voltage : [1.300V]

DRAM Voltage : [1.650V]

DRAM timing : 9, 9, 9, 27

you can check next page

(Data rate : $975 * 2 = 1950$, timing : 9, 9, 9, 27 , multi-core test =>

pass!)

[0 Errors] MemTest

Enter megabytes of RAM to test

870

Start Testing Stop Testing

About MemTest

If you find the free version useful, please considering purchasing the PRO (\$5) or Deluxe (\$14) versions, which add additional features.

[N] 104.7% Coverage, 0 Errors

[0 Errors] MemTest

Enter megabytes of RAM to test

870

Start Testing Stop Testing

About MemTest

If you find the free version useful, please considering purchasing the PRO (\$5) or Deluxe (\$14) versions, which add additional features.

[N] 103.6% Coverage, 0 Errors

[0 Errors] MemTest

Enter megabytes of RAM to test

870

Start Testing Stop Testing

About MemTest

If you find the free version useful, please considering purchasing the PRO (\$5) or Deluxe (\$14) versions, which add additional features.

[N] 103.6% Coverage, 0 Errors

[0 Errors] MemTest

Enter megabytes of RAM to test

All unused RAM

Start Testing Stop Testing

About MemTest

If you find the free version useful, please considering purchasing the PRO (\$5) or Deluxe (\$14) versions, which add additional features.

[N] 110.9% Coverage, 0 Errors

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

CPU 使用率記錄

記憶體

實體記憶體使用記錄

實體記憶體 (MB)	4087	系統	
總共	251	控制代碼	8137
快取的	248	執行緒	356
可用	5	處理程序	34
未使用		存留時間	0:00:22:17
		認可 (MB)	4021 / 8172

核心記憶體 (MB)

已分頁	96
非分頁	16

資源監視器(R)...

處理程序: 34 CPU 使用率: 100% 實體記憶體: 93%

Z CPU-Z

CPU Caches Mainboard Memory SPD Graphics About

Processor

Name Intel Core i3 540

Code Name Clarkdale Brand ID

Package Socket 1156 LGA

Technology 32 nm Core Voltage 1.168 V

Specification Intel(R) Core(TM) i3 CPU 540 @ 3.07GHz

Family	6	Model	5	Stepping	2
Ext. Family	6	Ext. Model	25	Revision	C2

Instructions MMX, SSE (1, 2, 3, 3S, 4.1, 4.2), EM64T, VT-x

Clocks (Core #0)

Core Speed	2926.2 MHz
Multiplier	x 15.0
Bus Speed	195.1 MHz
QPI Link	4291.8 MHz

Cache

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

Selection Processor #1 Cores 2 Threads 4

CPU-Z Version 1.56 Validate OK

Z CPU-Z

CPU Caches Mainboard Memory

Motherboard

Manufacturer ASRock

Model H55M-LE

Chipset Intel

Southbridge Intel

LPCIO Winbond

BIOS

Brand American Megatrends

Version P1.60

Date 09/01/2010

Graphic Interface

Version

Link Width x16

Side Band

CPU-Z Version 1.56

Z CPU-Z

CPU Caches Mainboard Memory SPD Graphics About

General

Type DDR3 Channels # Dual

Size 4096 MBytes DC Mode Symmetric

NB Frequency 3121.2 MHz

Timings

DRAM Frequency	975.4 MHz
FSB:DRAM	4:20
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)	96 clocks
Command Rate (CR)	1T
DRAM Idle Timer	
Total CAS# (tRDRAM)	
Row To Column (tRCD)	

CPU-Z Version 1.56 Validate OK

Z CPU-Z

CPU Caches Mainboard Memory

Memory Slot Selection

Slot #1 DDR3

Module Size 2048 MB

Max Bandwidth PC3-10700 (6)

Manufacturer

Part Number PRINCO-DR3-

Serial Number

Timings Table JEDEC #3

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

CPU-Z Version 1.56