

PRINCO DDR3-1600 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 DDR3-1600 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 #1]

BIOS will load X.M.P parameter in SPD on DIMM board , which are performance optimized for PRINCO DDR3-1600 DIMM board

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

Step 1: Select "OC Tweaker"

Step 2: Load XMP Setting

Set [Profile 1]

Step 3: QPI Frequency

Set [AUTO]

BIOS SETUP UTILITY

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

OC Tweaker Settings 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 1] Step 2
Profile 1 : DDR3 1600 7-9-7-24 1.60V	
Intelligent Energy Saver	[Disabled]
Good Night LED	[Disabled]
Overclock Mode	[Manual]
BCLK Frequency (MHz)	[160]
Boot Failure Guard	[Enabled]
Boot Failure Guard Count	[3]
Spread Spectrum	[Auto]
CPU Ratio Setting	23 [19]
QPI Frequency	5.866GT [Auto] Step 3

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

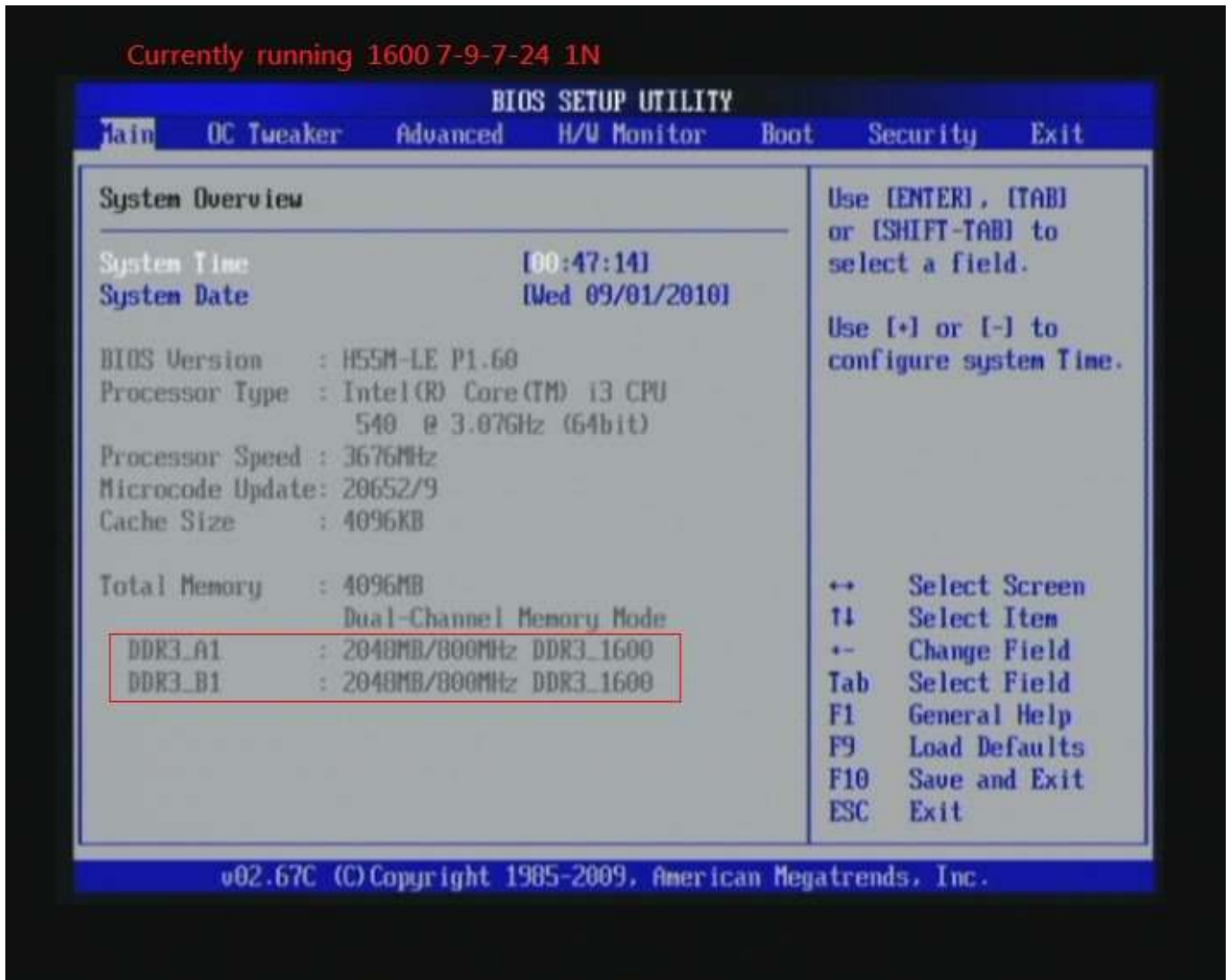
←→ Select Screen
↑↓ Select Item
←→ Change Option
F1 General Help
F9 Load Defaults
F10 Save and Exit
ESC Exit

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4. Save BIOS changes [F10] and exit



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



Test result?

In order to demonstrate the performance and stability of PRINCO DDR3-1600 DIMM board, We use the strictest stress testing, that is, multi-core MemTest in window 7.

(Data rate : 799.6Mhz*2, timing : 7, 9, 7, 24, multi-core test => pass!)

The image displays a collage of screenshots from a Windows 7 system during a stress test. The top row shows four MemTest86 windows, each reporting 0 errors and 100% coverage (133.7%, 133.8%, 140.4%, and 128.4% respectively). The middle row shows two CPU-Z windows: the left one shows the processor details for an Intel Core i3 540 (3.07GHz), and the right one shows the motherboard details (ASRock H55M-LE). The bottom row shows a Windows Task Manager window with CPU usage at 100% and memory usage at 3.75 GB, alongside another CPU-Z window showing memory slot selection and timing details for the PRINCO DDR3-1600 DIMM board.

MemTest86 Results:

- Window 1: 133.7% Coverage, 0 Errors
- Window 2: 133.8% Coverage, 0 Errors
- Window 3: 140.4% Coverage, 0 Errors
- Window 4: 128.4% Coverage, 0 Errors

CPU-Z Processor Information:

- Processor: Intel Core i3 540
- Code Name: Clarkdale
- Package: Socket 1156 LGA
- Technology: 32 nm
- Core Voltage: 1.264 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 3038.3 MHz, Multiplier x 19.0, Bus Speed 159.9 MHz, QPI Link 3518.0 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 Memory Information:

- General: Type DDR3, Channels # Dual, Size 4096 MBytes, DC Mode Symmetric, NB Frequency 2558.7 MHz
- Timings:

DRAM Frequency	799.6 MHz
FSB:DRAM	4:20
CAS# Latency (CL)	7.0 clocks
RAS# to CAS# Delay (tRCD)	9 clocks
RAS# Precharge (tRP)	7 clocks
Cycle Time (tRAS)	24 clocks
Row Refresh Cycle Time (tRFC)	88 clocks
Command Rate (CR)	1T
DRAM Idle Timer	
Total CAS# (tRDRAM)	
Row To Column (tRCD)	
- Memory Slot Selection: Slot #1, DDR3, Module Size 2048 MBytes, Max Bandwidth PC3-10700 (667)
- Timings Table:

	JEDEC #2	JEDEC #1
Frequency	533 MHz	609 MHz
CAS# Latency	7.0	7.0
RAS# to CAS#	7	7
RAS# Precharge	7	7
tRAS	20	20
IRC	27	27
Command Rate		
Voltage	1.50 V	1.50 V

Windows Task Manager Performance:

- CPU 使用率: 100%
- 記憶體: 3.75 GB
- 系統: 控制代碼 8424, 執行緒 387, 處理程序 35, 存留時間 0:00:30:00, 認可 (MB) 4014 / 8172

Advanced Overclocking and Testing

Part II : Heavy test

If you want to know the potential of PRINCO DDR3-1600? 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:180). Then select [DRAM Frequency] item , and set the DDR3 memory to higher clock rate (ex:DDR3-1800).
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

Set [Manual]

BCLK Frequency (MHz)

Set [180]

Step 3: DRAM Frequency

Set [900MHz DDR3_1800]

Step 4: CPU Ratio Setting

Set [16]

BIOS SETUP UTILITY

Main **OC Tweaker** Advanced H/W 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 [Default]

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

Intelligent Energy Saver [Disabled]

Good Night LED [Disabled]

Overclock Mode [Manual] Step 2

BCLK Frequency (MHz) [180]

Boot Failure Guard [Enabled]

Boot Failure Guard Count [3]

Spread Spectrum [Auto]

CPU Ratio Setting 23 [16] Step 4

QPI Frequency 5.0666T [Auto]

DRAM Frequency DDR3_1333 [900MHz DDR3_1800] Step 3

Select to choice the memory speed.

↔ Select Screen

F4 Select Item

+/- Change Option

F1 General Help

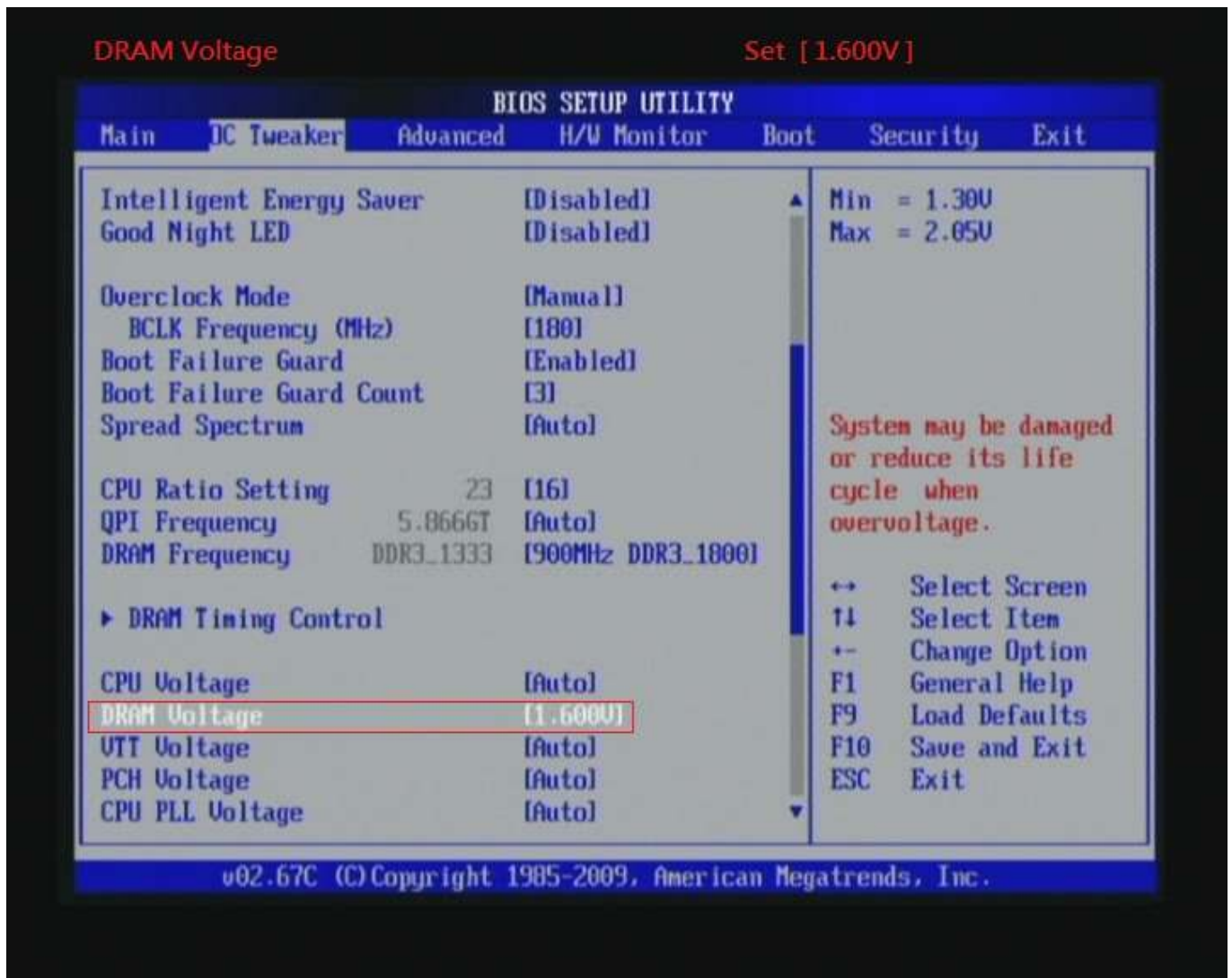
F9 Load Defaults

F10 Save and Exit

ESC Exit

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5. Select [DRAM Voltage] item , and set the value to [1.600V].



6. Enter [DRAM Timing Control] item



7. set [DRAM tCL] item to [7]

set [DRAM tRCD] item to [9]

set [DRAM tRP] item to [7]

set [DRAM tRAS] item to [24]

set [DRAM Command Rate] item to [1]

Step 1 : DRAM tCL Set [7]
DRAM tRCD Set [9]
DRAM tRP Set [7]
DRAM tRAS Set [24]
Step 2 : DRAM Command Rate Set [1]

Chipset Settings

OC Tweaker

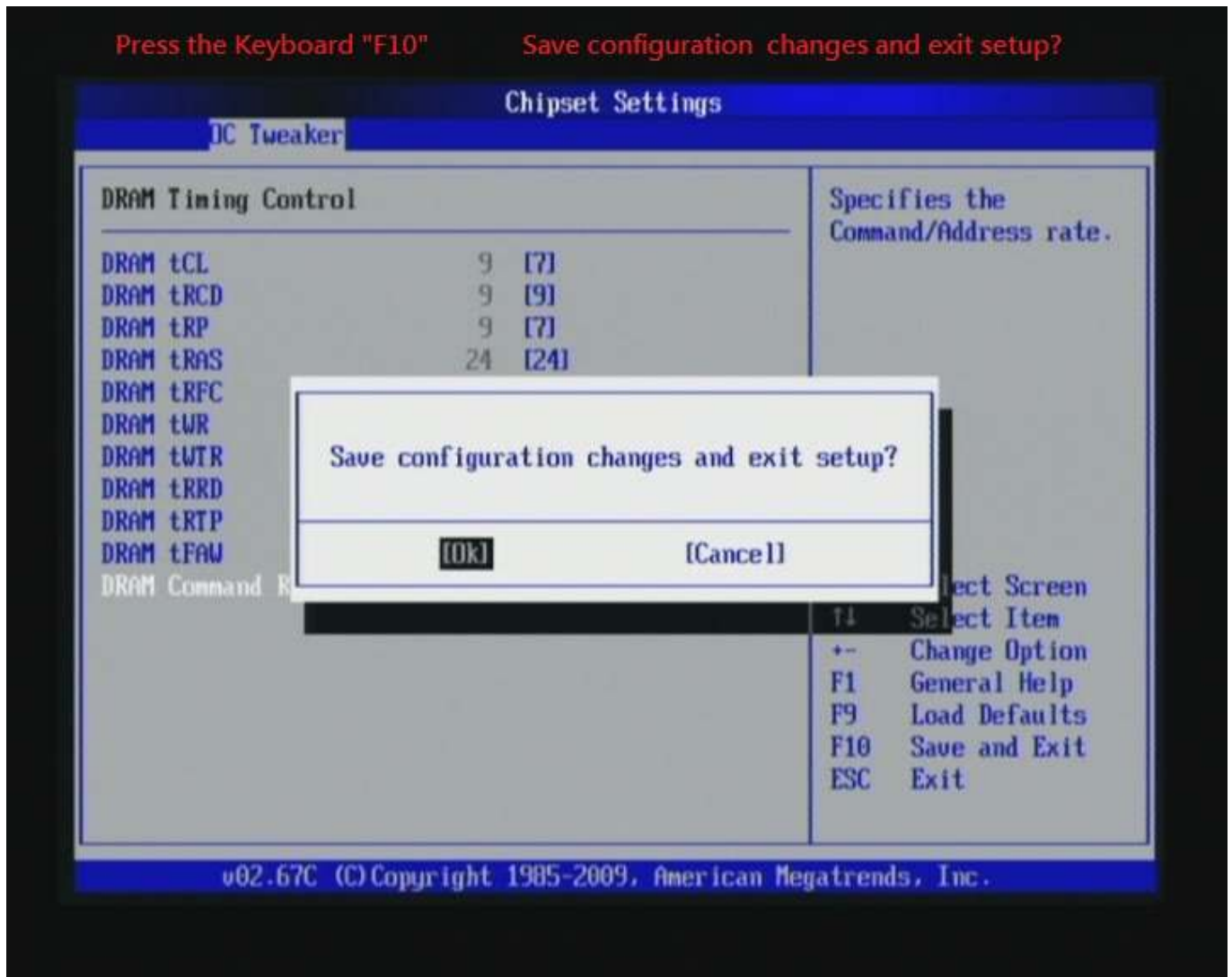
DRAM Timing Control

DRAM tCL	9	[7]	Step 1
DRAM tRCD	9	[9]	
DRAM tRP	9	[7]	
DRAM tRAS	24	[24]	
DRAM tRFC	74	[Auto]	
DRAM tWR	10	[Auto]	
DRAM tWTR	5	[Auto]	
DRAM tRRD	4	[Auto]	
DRAM tRTP	5	[Auto]	
DRAM tFAW	20	[Auto]	
DRAM Command Rate	11	[1]	Step 2

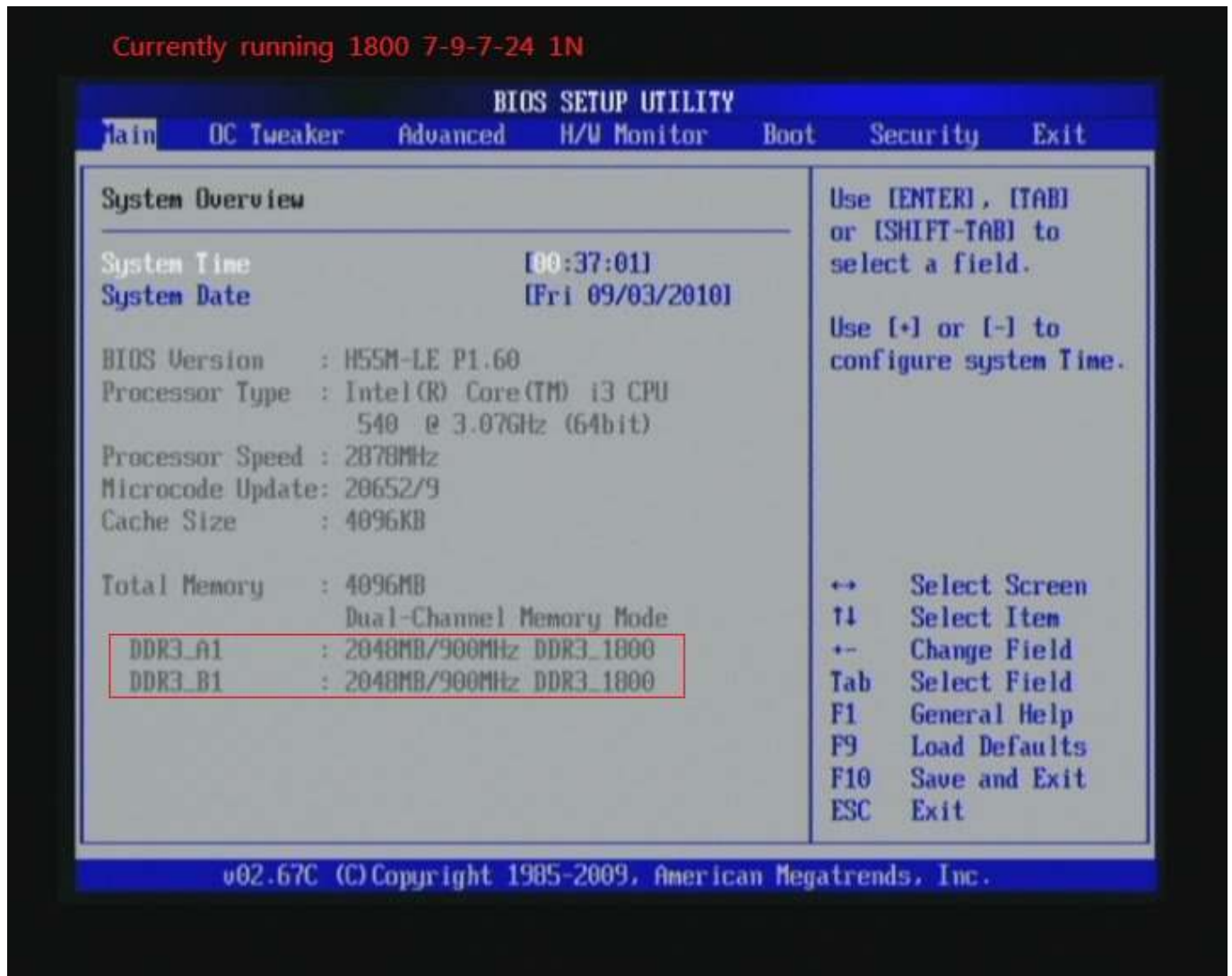
Specifies the Command/Address rate.

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

8. 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 DDR3-1600 potential.

(Data rate : 899.8*2, timing : 7, 9, 7, 24, multi-core test => pass!)

The image displays a Windows 7 desktop environment with several windows open, showing system performance and stress testing results.

MemTest86 Windows: Four instances of MemTest86 are shown, all reporting 0 errors. The first three instances show coverage of 269.1%, 270.8%, and 275.5% respectively. The fourth instance shows 255.5% coverage and 'All unused RAM' in the test area.

Windows Task Manager: Shows system resource usage:

- CPU Usage: 100%
- Memory Usage: 3.74 GB
- System Information: Total RAM 4087 MB, Free 256 MB, Used 371 MB.

CPU-Z Windows: Provides detailed hardware specifications:

- Processor:** Intel Core i3 540 (Clarkdale), Socket 1156 LGA, 32 nm, 1.016 V, 3.07 GHz.
- Clocks (Core #0):** Core Speed 2879.6 MHz, Multiplier x 16.0, 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).
- Memory (DDR3):** Type DDR3, Size 4096 MBytes, Channels # Dual, DC Mode Symmetric, NB Frequency 2879.5 MHz.
- Timings:** DRAM Frequency 899.8 MHz, FSB:DRAM 4:20, CAS# Latency (CL) 7.0 clocks, RAS# to CAS# Delay (tRCD) 9 clocks, RAS# Precharge (tRP) 7 clocks, Cycle Time (tRAS) 24 clocks, Row Refresh Cycle Time (tRFC) 100 clocks, Command Rate (CR) 1T.

System Information Windows: Shows motherboard details:

- Motherboard:** ASRock H55M-LE, Intel Chipset, Intel Southbridge, Winbond LPCIO.
- BIOS:** American Megatrends P1.60, Date 09/01/2010.
- Graphic Interface:** Version, Link Width x16, Side Band.

Part III : Advance test

If you set parameter in BIOS as below ,

Overclock Mode : [manual]

BCLK frequency(Mhz) : [190]

CPU Ratio Setting : [16]

DRAM Frequency : [950Mhz DDR3_1900]

DRAM Voltage : [1.600V]

DRAM timing : 9, 9, 9, 27

you can check next page

(Data rate : $950.7 * 2 = 1900$, 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] 110.8% 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.

[Y] 108.1% 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] 109.5% 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.

[Y] 109.3% 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

100%

記憶體

3.76 GB

實體記憶體 (MB)	
總共	4087
快取的	231
可用	232
未使用	5
核心記憶體 (MB)	
已分頁	99
非分頁	17

系統	
控制代碼	7904
執行緒	354
處理程序	33
存留時間	0:00:32:02
認可 (MB)	4025 / 8172

資源監視器(R)...

處理程序: 33 CPU 使用率: 100% 實體記憶體: 94%

Z CPU-Z

CPU Caches Mainboard Memory SPD Graphics About

Processor

Name: Intel Core i3 540

Code Name: Clarkdale Brand ID: [Intel CORE i3 inside]

Package: Socket 1156 LGA

Technology: 32 nm Core Voltage: 1.016 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	3042.0 MHz
Multiplier	x 16.0
Bus Speed	190.1 MHz
QPI Link	4182.7 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 SPD Graphics About

Motherboard

Manufacturer: ASRock

Model: H55M-LE

Chipset: Intel

Southbridge: Intel

LPCIO: Winbond

BIOS

Brand: American Megatronics

Version: P1.60

Date: 09/01/2010

Graphic Interface

Version: []

Link Width: []

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: 3042.2 MHz

Timings

DRAM Frequency	950.7 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)	106 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 SPD Graphics About

Memory Slot Selection

Slot #1: DDR3

Module Size: 2048

Max Bandwidth: PC3-10700

Manufacturer: []

Part Number: PRINCO-D

Serial Number: []

Timings Table JEDEC #2

Frequency	533 MHz
CAS# Latency	7.0
RAS# to CAS#	7
RAS# Precharge	7
tRAS	20
tRC	27
Command Rate	
Voltage	1.50 V

CPU-Z Version 1.56