PRINCO DDR3-1600 user guide and testing for Asus P6X58D Motherboard

CPU i7-950 3.07G

Part I：Standard test

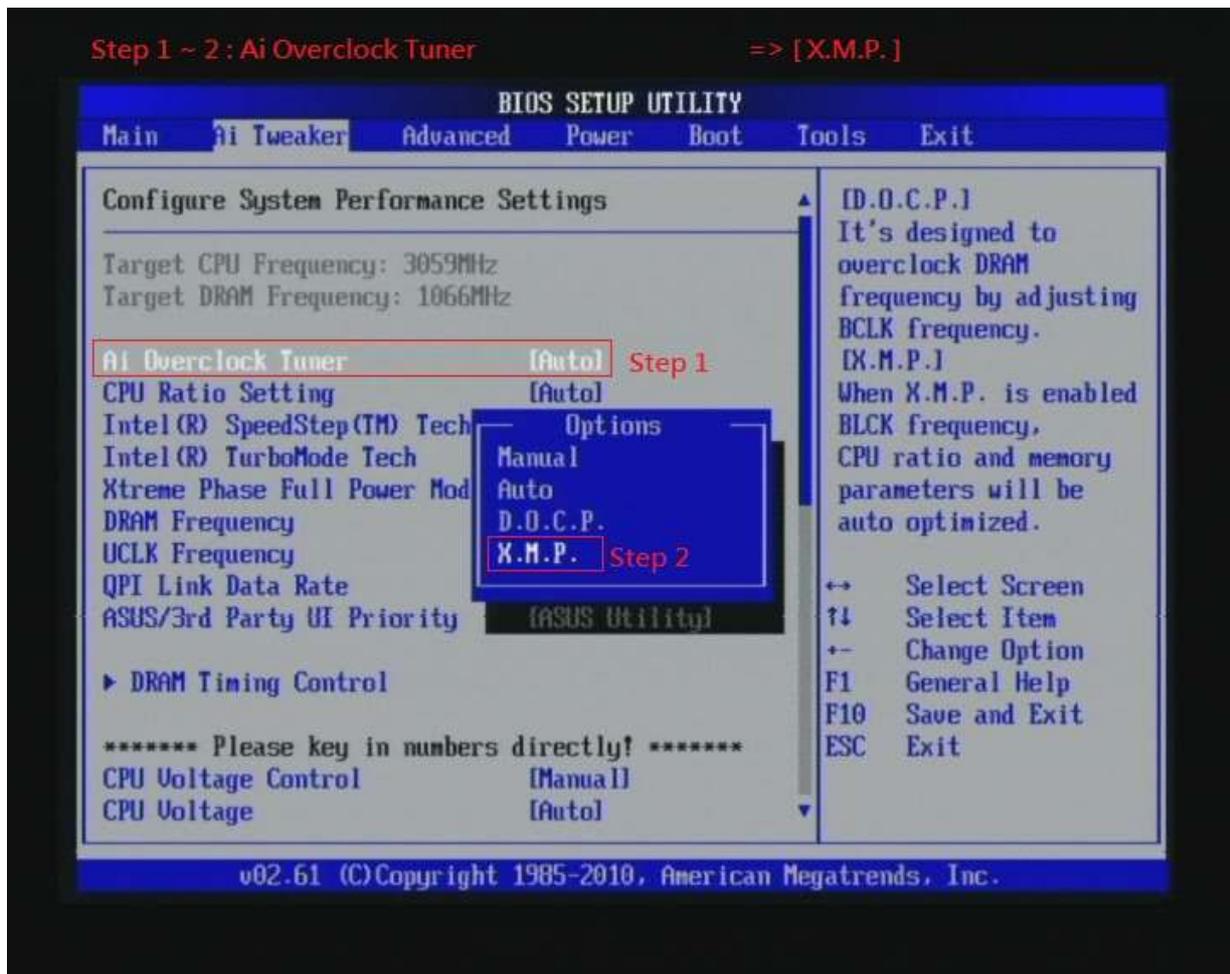*It's the easiest way to enjoy overclock benefit by using PRINCO DDR3-1600 DIMM board*

How to use?

0. Clear BIOS to mainboard initial setting

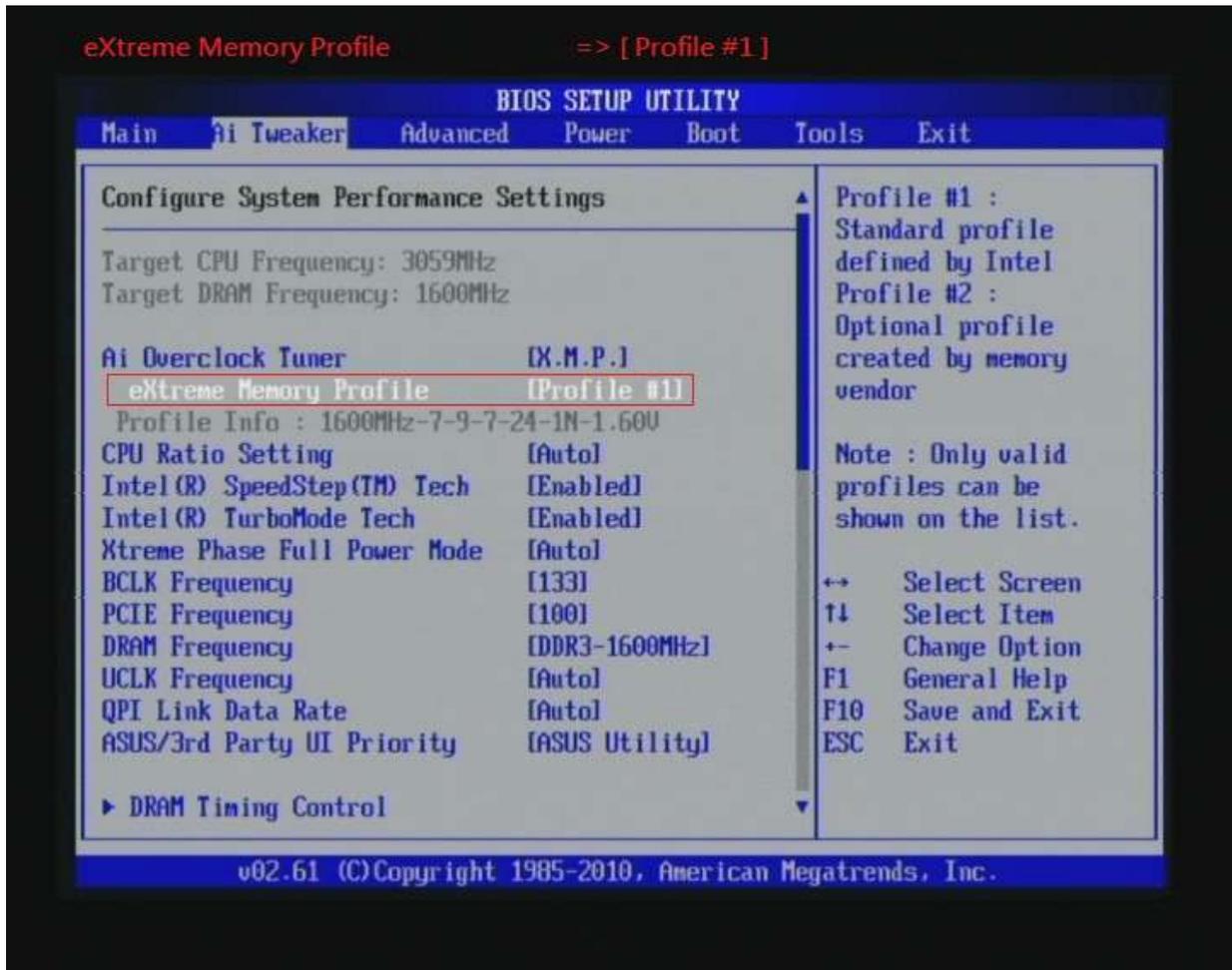1. Enter BIOS setup and [Ai Tweaker] menu

2. Enter [Ai Overclock Tuner] 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 DDR3-1600

   DIMM board

3. Enter [eXtreme Memory Profile] item and select [Profile #1]

eXtreme Memory Profile => [Profile #1]

BIOS SETUP UTILITY

Main   Ai Tweaker   Advanced   Power   Boot   Tools   Exit

Configure System Performance Settings

Target CPU Frequency: 3059MHz
Target DRAM Frequency: 1600MHz

Ai Overclock Tuner	[X.M.P.]
eXtreme Memory Profile	[Profile #1]
Profile Info : 1600MHz-7-9-7-24-1N-1.60V	
CPU Ratio Setting	[Auto]
Intel(R) SpeedStep(TM) Tech	[Enabled]
Intel(R) TurboMode Tech	[Enabled]
Xtreme Phase Full Power Mode	[Auto]
BCLK Frequency	[133]
PCIE Frequency	[100]
DRAM Frequency	[DDR3-1600MHz]
UCLK Frequency	[Auto]
QPI Link Data Rate	[Auto]
ASUS/3rd Party UI Priority	[ASUS Utility]

▶ DRAM Timing Control

Profile #1 :
Standard profile
defined by Intel
Profile #2 :
Optional profile
created by memory
vendor

Note : Only valid
profiles can be
shown on the list.

↔   Select Screen
↑↓ Select Item
+- Change Option
F1   General Help
F10 Save and Exit
ESC Exit

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4. Save BIOS changes [F10] and exit

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：801.8*2=1600, timing：7, 9, 7, 24, multi-core test => pass!)

Advanced Overclocking and Testing
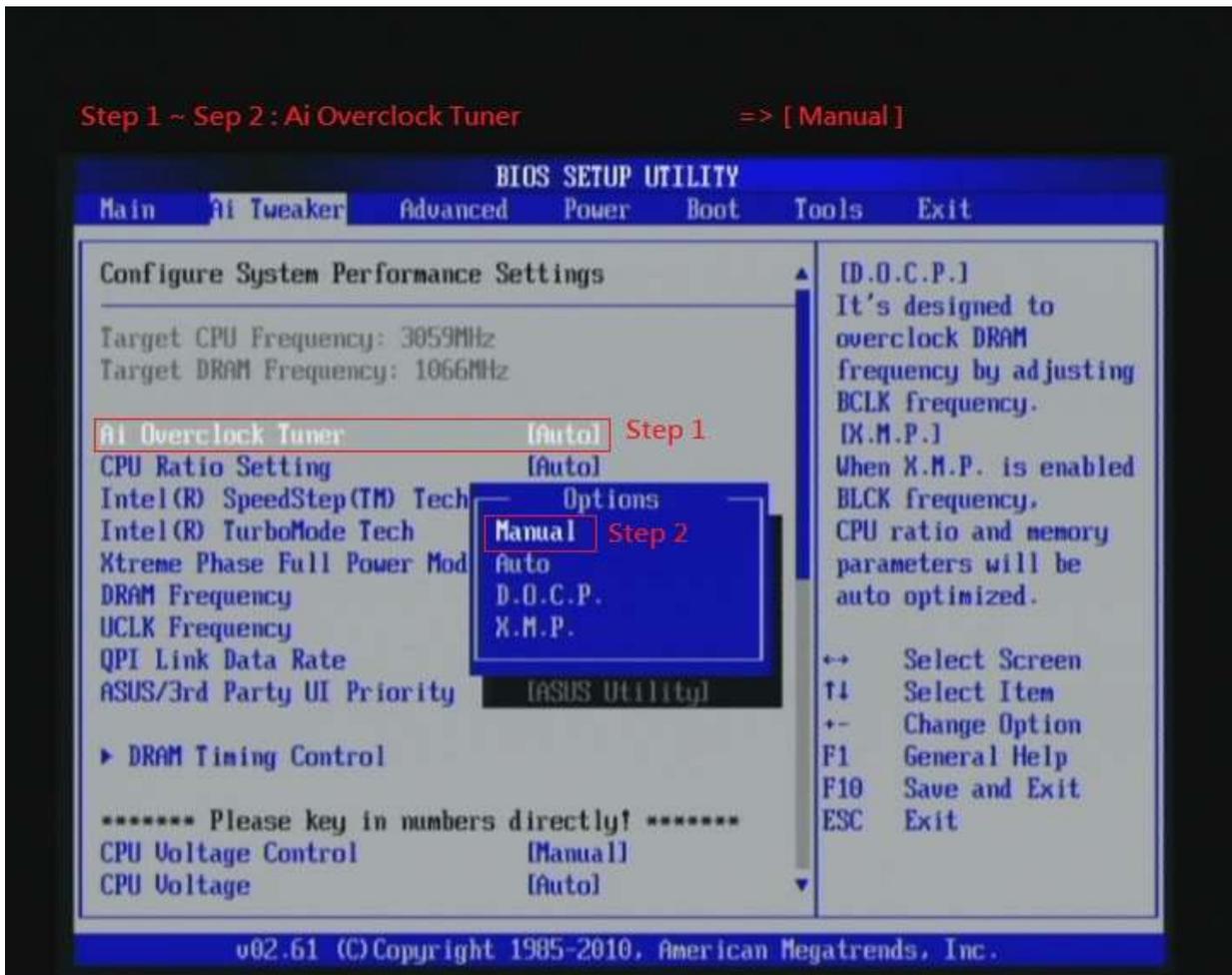
Part II：Heavy test

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 [Ai Tweaker] menu

2. Enter [Ai Overclock Tuner] item and select Manual

Step 1 ~ Sep 2 : Ai Overclock Tuner   => [Manual]

BIOS SETUP UTILITY

Main   Ai Tweaker   Advanced   Power   Boot   Tools   Exit

Configure System Performance Settings

Target CPU Frequency: 3059MHz
Target DRAM Frequency: 1066MHz

Ai Overclock Tuner   [Auto]   Step 1
CPU Ratio Setting   [Auto]
Intel(R) SpeedStep(TM) Tech ┌──── Options ────┐
Intel(R) TurboMode Tech   │ Manual │ Step 2 │
Xtreme Phase Full Power Mod │ Auto   │
DRAM Frequency   │ D.O.C.P.   │
UCLK Frequency   │ X.M.P.   │
QPI Link Data Rate   │   │
ASUS/3rd Party UI Priority │   [ASUS Utility] │

▶ DRAM Timing Control

******* Please key in numbers directly! *******
CPU Voltage Control   [Manual]
CPU Voltage   [Auto]

[D.O.C.P.]
It's designed to
overclock DRAM
frequency by adjusting
BCLK frequency.
[X.M.P.]
When X.M.P. is enabled
BLCK frequency,
CPU ratio and memory
parameters will be
auto optimized.

↔   Select Screen
↑↓   Select Item
+-   Change Option
F1   General Help
F10   Save and Exit
ESC   Exit
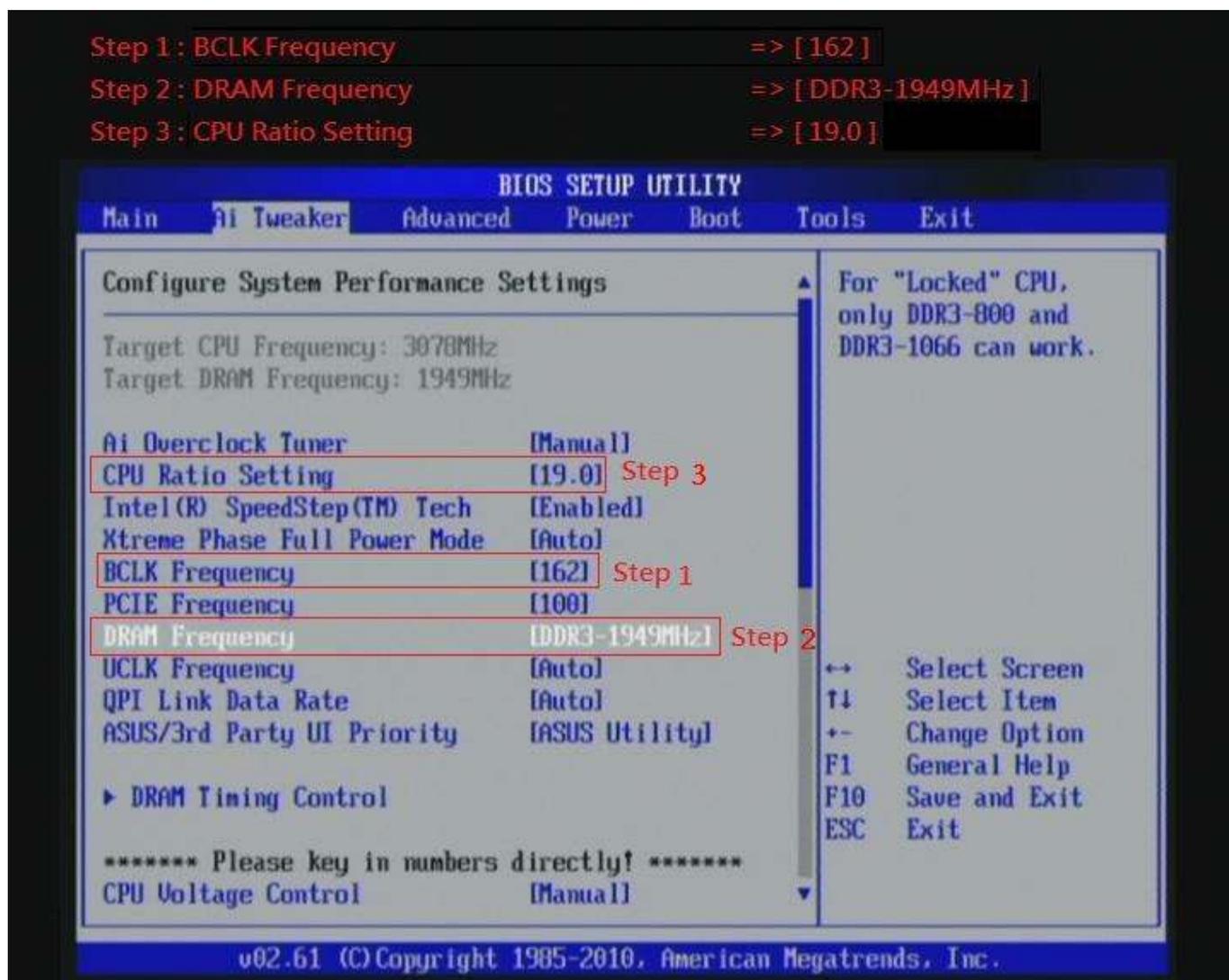
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3. Select [BLCK Frequency] item，and increase to higher Base clock rate (ex:162). Then select [DRAM Frequency] item，and set the DDR3 memory to higher clock rate (ex:DDR3-1949). Don't forget setting [CPU Ratio Setting] item to suitable ratio [ex:19]

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

4. Enter [DRAM Timing Control] item
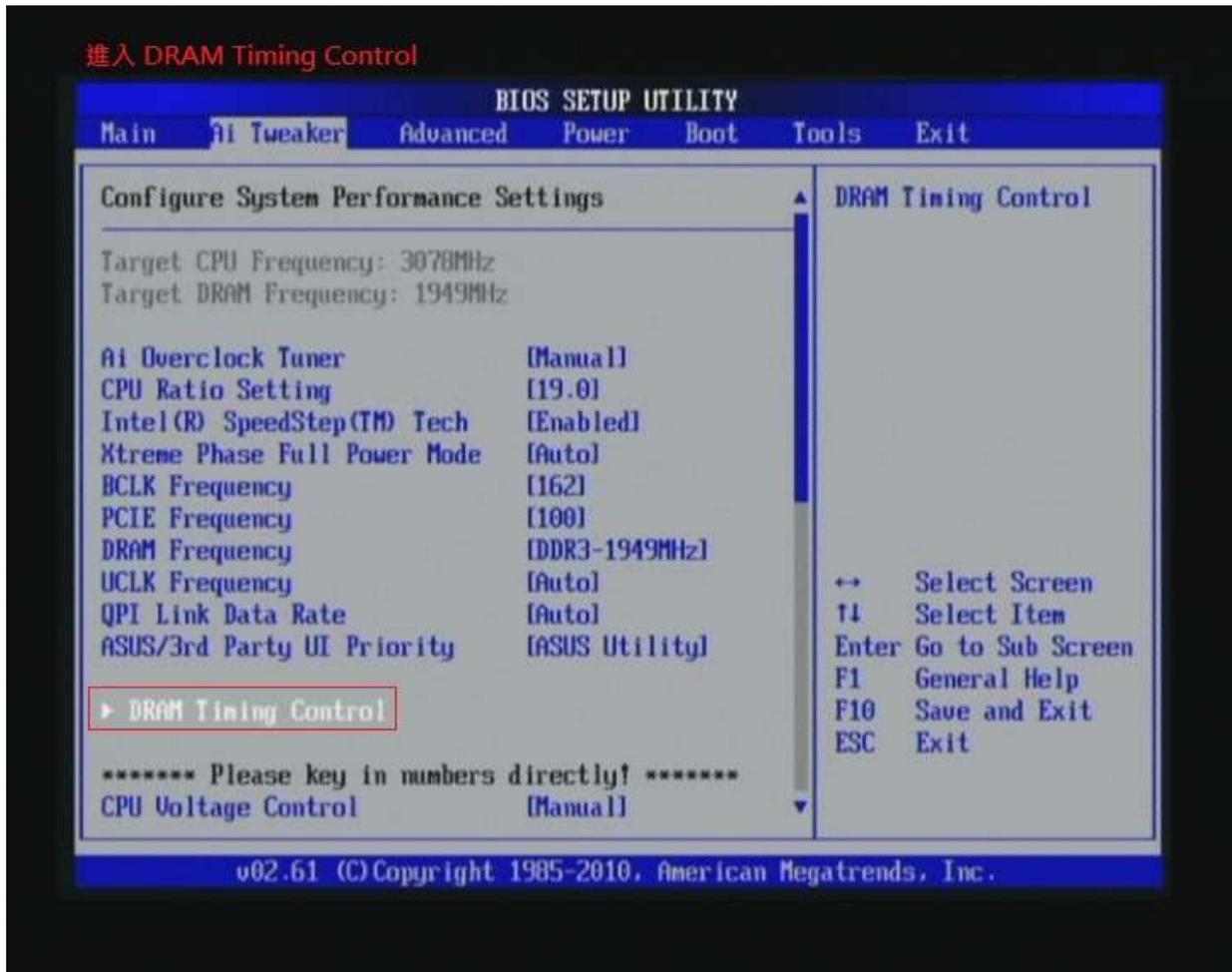
5. set [DRAM CAS# Latency] item to [7 DRAM Clock]

   set [DRAM RAS# to CAS# Delay] item to [9 DRAM Clock]

   set [DRAM RAS# PRE Time] item to [7 DRAM Clock]

   set [DRAM RAS# ACT Time] item to [24 DRAM Clock]

   set [DRAM Timing Mode] item to [1N]

   then return to previous to [Ai Overclock Tuner] menu

6. Select [QPI/DRAM Core Voltage] item , and set the value

 to [1.58125].

 Select[DRAM Bus Voltage] item , and set the value to [1.64]

Step 1 : QPI/DRAM Core Voltage   => [1.58125]
Step 2 : DRAM Bus Voltage   => [1.64]

```
                          BIOS SETUP UTILITY
 Main   Ai Tweaker   Advanced   Power   Boot   Tools   Exit

 DRAM Frequency            [DDR3-1949MHz]   ▲  Min = 1.20U
 UCLK Frequency            [Auto]              Max = 2.46U(•)
 QPI Link Data Rate        [Auto]              Standard  = 1.50U
 ASUS/3rd Party UI Priority [ASUS Utility]     Increment = 0.02U
                                               +/- : Raise/Reduce
 ▶ DRAM Timing Control
                                               [Be optimized by XMP]
 ••••••• Please key in numbers directly! •••••••  • : Max = 2.46U only
 CPU Voltage Control       [Manual]             if OU_DRAM_BUS jumper
 CPU Voltage               [Auto]               is moved to 2-3 pins,
 CPU PLL Voltage           [Auto]               otherwise Max = 2.0U.
 QPI/DRAM Core Voltage     [1.58125] Step 1
 IOH Voltage               [Auto]            ↔     Select Screen
 IOH PCIE Voltage          [Auto]            ↑↓    Select Item
 ICH Voltage               [Auto]            F1    General Help
 ICH PCIE Voltage          [Auto]            F10   Save and Exit
 DRAM Bus Voltage          [1.64]  Step 2    ESC   Exit
 DRAM DATA REF Voltage on CHA  [Auto]
 DRAM CTRL REF Voltage on CHA  [Auto]
 DRAM DATA REF Voltage on CHB  [Auto]        ▼

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```

7. Save BIOS changes [F10] and exit

Test result?

We use the strictest stress testing， multi-core MemTest in window 7， to show you PRINCO DDR3-1600 potential.

(Data rate：971.4*2=1943， timing：7, 9, 7, 24， multi-core test => pass!)

Part III：Advance test

If you set parameter in BIOS as below ,

Overclock Mode：[manual]

BCLK frequency(Mhz) ：[166]

CPU Ratio Setting：[18.0]

DRAM Frequency：[DDR3_1997]

CPU Voltage：[Auto]

QPI/DRAM Core Voltage：[1.58125V]

DRAM Voltage：[1.64]

DRAM timing：9, 9, 9, 27

you can check next page

(Data rate：995*2=1990， timing：9, 9, 9, 27， multi-core test =>

pass!)

MemTest Window 1
[0 Errors] MemTest

Enter megabytes of RAM to test

700

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.

[√] 130.0% Coverage, 0 Errors

MemTest Window 2
[0 Errors] MemTest

Enter megabytes of RAM to test

700

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.

[√] 128.9% Coverage, 0 Errors

MemTest Window 3
[0 Errors] MemTest

Enter megabytes of RAM to test

700

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.

[√] 128.0% Coverage, 0 Errors

MemTest Window 4
[0 Errors] MemTest

Enter megabytes of RAM to test

700

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.

[√] 127.8% Coverage, 0 Errors

MemTest Window 5
[0 Errors] MemTest

Enter megabytes of RAM to test

700

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.

[√] 126.8% Coverage, 0 Errors

MemTest Window 6
[0 Errors] MemTest

Enter megabytes of RAM to test

700

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.

[√] 124.9% Coverage, 0 Errors

MemTest Window 7
[0 Errors] MemTest

Enter megabytes of RAM to test

700

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.

[√] 126.7% Coverage, 0 Errors

MemTest Window 8
[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.

[√] 331.2% Coverage, 0 Errors

CPU-Z — CPU Tab
CPU | Caches | Mainboard | Memory | SPD | Graphics | About

Processor
Name	Intel Core i7 950
Code Name	Bloomfield
Brand ID	
Package	Socket 1366 LGA
Technology	45 nm
Core Voltage	1.240 V
Specification	Intel(R) Core(TM) i7 CPU 950 @ 3.07GHz
Family	6	Model	A	Stepping	5
Ext. Family	6	Ext. Model	1A	Revision	D0
Instructions	MMX, SSE (1, 2, 3, 3S, 4.1, 4.2), EM64T, VT-x

Clocks (Core #0)
Core Speed	2985.3 MHz
Multiplier	x 18.0
Bus Speed	165.9 MHz
QPI Link	2985.3 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

CPU-Z Version 1.56   Validate | OK

CPU-Z — Mainboard Tab
CPU | Caches | Mainboard | Memor...

Motherboard
Manufacturer	ASUSTeK Computer I...
Model	P6X58D PREMIUM
Chipset	Intel
Southbridge	Intel
LPCIO	Winbond

BIOS
Brand	American Megatrends
Version	0813
Date	05/25/2010

Graphic Interface
Version	
Link Width	x16
Side Band	

CPU-Z Version 1.56

CPU-Z — Memory Tab
CPU | Caches | Mainboard | Memory | SPD | Graphics | About

General
Type	DDR3
Size	6144 MBytes
Channels #	Triple
DC Mode	
NB Frequency	3980.4 MHz

Timings
DRAM Frequency	995.1 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)	

CPU-Z Version 1.56   Validate | OK

CPU-Z — SPD Tab
CPU | Caches | Mainboard | Memor...

Memory Slot Selection
Slot #1   DDR3

Module Size	2048 MByt...
Max Bandwidth	PC3-10700 (667...
Manufacturer	
Part Number	PRINCO-DR3-16...
Serial Number	

Timings Table
	JEDEC #2	JE...
Frequency	533 MHz	6...
CAS# Latency	7.0	
RAS# to CAS#	7	
RAS# Precharge	7	
tRAS	20	
tRC	27	
Command Rate		
Voltage	1.50 V	1...

CPU-Z Version 1.56

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

100 %

記憶體   實體記憶體使用記錄

5.65 GB