

The background of the advertisement is a high-tech, futuristic scene. It features a large, glowing blue cylindrical structure that resembles a tunnel or a data stream, with various light effects and geometric patterns. The overall aesthetic is clean, modern, and emphasizes advanced technology.

ASRock®

Z370
EXTREME 4

ユーザーマニュアル

1.2

2017 11

Copyright©2017 ASRock INC.

ASRock

ASRock

ASRock

ASRock

ASRock

ASRock



FCC

15

2

1
2

BMP

www.dtsc.ca.gov/hazardouswaste/perchlorate

ASRock : <http://www.asrock.com>

ASRock : + 886-2-28965588
123
HDMI™ HDMI
HDMI Licensing
LLC



7,003,467 : 5,956,674; 5,974,380; 6,487,535;
DTS DTS
DTS Connect DTS Interactive DTS Neo:PC DTS, Inc

© DTS, Inc., All Rights Reserved.



1		1
1.1		1
1.2		2
1.3		8
1.4	I/O	10
2		12
2.1	CPU	13
2.2	CPU	16
2.3		(DIMM) 17
2.4		19
2.5	I/O	20
2.6		21
2.7	SATA	22
2.8		24
2.9		26
2.10		27
2.11		28
2.12		29
2.13		30
2.14	SLI™	SLI™ 40
2.14.1	2 SLI™	40
2.14.2		42

2.15	CrossFireX™ 3 CrossFireX™	CrossFireX™	43
2.15.1	2	CrossFireX™	43
2.15.2	3	CrossFireX™	45
2.15.3			46
2.16	M.2 WiFi/BT	(M2_3)	47
2.17	M.2_SSD (NGFF) M2_2)	(M2_1 and M2_2)	49
3			53
3.1			53
3.2	A-Tuning		54
3.2.1	A-Tuning		54
3.2.2	A-Tuning		54
3.3	ASRock Live Update & APP Shop	ASRock APP	59
3.3.1	UI		59
3.3.2	Apps		60
3.3.3	BIOS & Drivers	BIOS	63
3.3.4			64
3.4	ASRock RGB LED		65
4	UEFI		67
4.1			67
4.2	EZ Mode (EZ)		68
4.3	Advanced Mode ()		69

4.3.1	UEFI	69
4.3.2		70
4.4	Main ()	71
4.5	OC Tweaker (OC)	72
4.6	Advanced ()	83
4.6.1	CPU Configuration (CPU)	84
4.6.2	Chipset Configuration ()	86
4.6.3	Storage Configuration ()	90
4.6.4	Intel® Thunderbolt	92
4.6.5	Super IO Configuration IO	93
4.6.7	USB Configuration (USB)	96
4.6.8	Trusted Computing	98
4.7	Tools ()	99
4.8	Hardware Health Event Monitoring ()	103
4.9	Security ()	108
4.10	Boot ()	109
4.11	Exit ()	112

1

ASRock Z370 Extreme4

ASRock

ASRock

1

2

3

4

BIOS



1.1

- ASRock Z370 Extreme4 ATX
- ASRock Z370 Extreme4
- ASRock Z370 Extreme4 CD
- 1 x I/O
- 4 x ATA SATA
- 1 x ASRock SLI_HB_Bridge_2S
- 3 x M.2

1.2

- ATX

CPU	<ul style="list-style-type: none"> • 8 Intel® Core™ 1151 • • 12 • Intel® 2.0 • Intel® K CPU • ASRock BCLK
-----	---

- Intel® Z370

	<ul style="list-style-type: none"> • DDR4 • 4 x DDR4 DIMM • DDR4 4333+ (OC)*/4000(OC)/3866(OC)/3800(OC)/3733 (OC)/3600(OC)/3200(OC)/2933(OC)/2800(OC)/2666/2400/2133 ECC * ASRock
	(http://www.asrock.com/)
* 8 Intel® CPU	2666 DDR4
• ECC UDIMM	non-ECC
•	64GB
• Intel®	XMP 2.0
• DIMM	15 μ

- 3 x PCI Express 3.0 x16 PCIE2/PCIE4/ PCIE6: x16 (PCIE2) x8 (PCIE2) / x8 (PCIE4) x8 (PCIE2) / x8 (PCIE4) / x4 (PCIE6))*
- * NVMe SSD
- 3 x PCI Express 3.0 x1 (Flexible PCIe)
- AMD Quad CrossFireX™ 3-Way CrossFireX™ CrossFireX™
- NVIDIA® Quad SLI™ SLI™

- 1 x M.2 (E) 2230 WiFi/BT
- VGA PCIe 15 μ
PCI E2

- Intel® UHD GPU VGA

- Intel® UHD AVC MVC (S3D) MPEG-2 Full HW Encode1
Intel® Intel®
InTru™ 3D, Intel® HD
Intel® Insider™, Intel® UHD

- DirectX 12

- HWA / : VP9 8- VP9 10-
() VP8 HEVC (MPEG-H Part2
h.265) AVC (MPEG4 h.264) MPEG2-Part2 (h.262)
JPEG/MJPEG VC-1

- 1,024MB

*

- 3 : D-Sub DVI-D
HDMI

- 3

- HDMI 4K x 2K (4096x2160) @ 30Hz

- DVI-D 1920x1200 @ 60Hz

- D-Sub 1920x1200 @ 60Hz

- HDMI

12bpc xvYCC HBR

HDMI

- DVI-D HDMI HDCP

- HDMI 4K HD (UHD)

- 7.1 CH HD
Realtek ALC1220

-

-

- Purity Sound™ 4

-

- SNR 120dB DAC
- NE5532
- 600 Ohms
- Pure Power-In ()
-
- PCB
-
- R/L PCB
- RGB LED
- 15 μ
- DTS

LAN	<ul style="list-style-type: none"> • LAN 10/100/1000 Mb/s • PHY Intel® I219V • Wake-On-LAN • / ESD • 802.3az • PXE
-----	--

I/O	<ul style="list-style-type: none"> • 2 x • 1 x PS/2 / • 1 x D-Sub • 1 x DVI-D • 1 x HDMI • 1 x SPDIF • 1 x USB 3.1 Gen2 Type-A 10 Gb/s ASMedia ASM3142 ESD • 1 x USB 3.1 Gen2 Type-C 10 Gb/s ASMedia ASM3142 ESD • 4 x USB 3.1 Gen1 (Intel® Z370) ESD • LED 1 x RJ-45 LAN ACT/LINK LED SPEED LED • HD : / / / / /
-----	---

<ul style="list-style-type: none"> • 6 x SATA3 6.0 Gb/s RAID RAID 0 RAID 1 RAID 5 RAID 10 Intel 15 NCQ AHCI *

- 2 x ASMedia ASM1061 SATA3 6.0 Gb/s
NCQ AHCI
- * M2_1 SATA3_0 SATA3_1

- * M2_2 SATA3_4 SATA3_5

- 1 x M.2 (M2_1) M Key
2230/2242/2260/2280 M.2 SATA3 6.0 Gb/s
Gen3 x4 (32 Gb/s) M.2 PCI Express
**
- 1 x M.2 (M2_2) M Key
2230/2242/2260/2280/22110 M.2 SATA3 6.0 Gb/s
Gen3 x4 (32 Gb/s) M.2 PCI
Express **
- ** Intel® Optane™
- ** NVMe SSD
- ** ASRock U.2

- 1 x COM
- 1 x TPM
- 1 x LED
- 1 x RGB LED
- * 12V/3A 36W LED
- 1 x CPU 4 CPU
- * CPU 1A (12W) CPU

- 1 x CPU /
4
- * CPU / 1.5A
(18W)
- 2 x 4

- 1 x /
4
- * /
1.5A (18W)
- * CPU_FAN1 CHA_FAN2 3 4

- 1 x 24 ATX

- 1 x 8 12V
- 1 x (15μ)
- 1 x Thunderbolt AIC (5)
- 3 x USB 2.0 6 USB 2.0 (Intel® Z370) ESD
- 1 x USB 3.1 Gen1 2 USB 3.1 Gen1 (Intel® Z370) ESD
- 1 x USB 3.1 Gen1 2 USB 3.1 Gen1 ASMedia ASM1074 / ESD
- 1 x C USB 3.1 Gen1 ASMedia ASM1074

BIOS	• 2 x AMI UEFI Legal BIOS GUI 1 x
	BIOS 1 x BIOS
	• UEFI
	• ACPI 6.0
	• SMBIOS 2.7
	• CPU / GT / DRAM
	PCH 1.0V VCCIO VCCST VCCSA VCCPLL CPU
	PLL GT PLL PLL PLL

- : CPU CPU / /
- : CPU CPU / /
- CPU : CPU CPU / /
- : CPU CPU / /
- : +12V +5V +3.3V CPU Vcore DRAM VPPM PCH 1.0V VCCSA VCCST

OS

- Microsoft® Windows® 10 64-bit

- FCC CE
- ErP/EuP Ready ErP/EuP

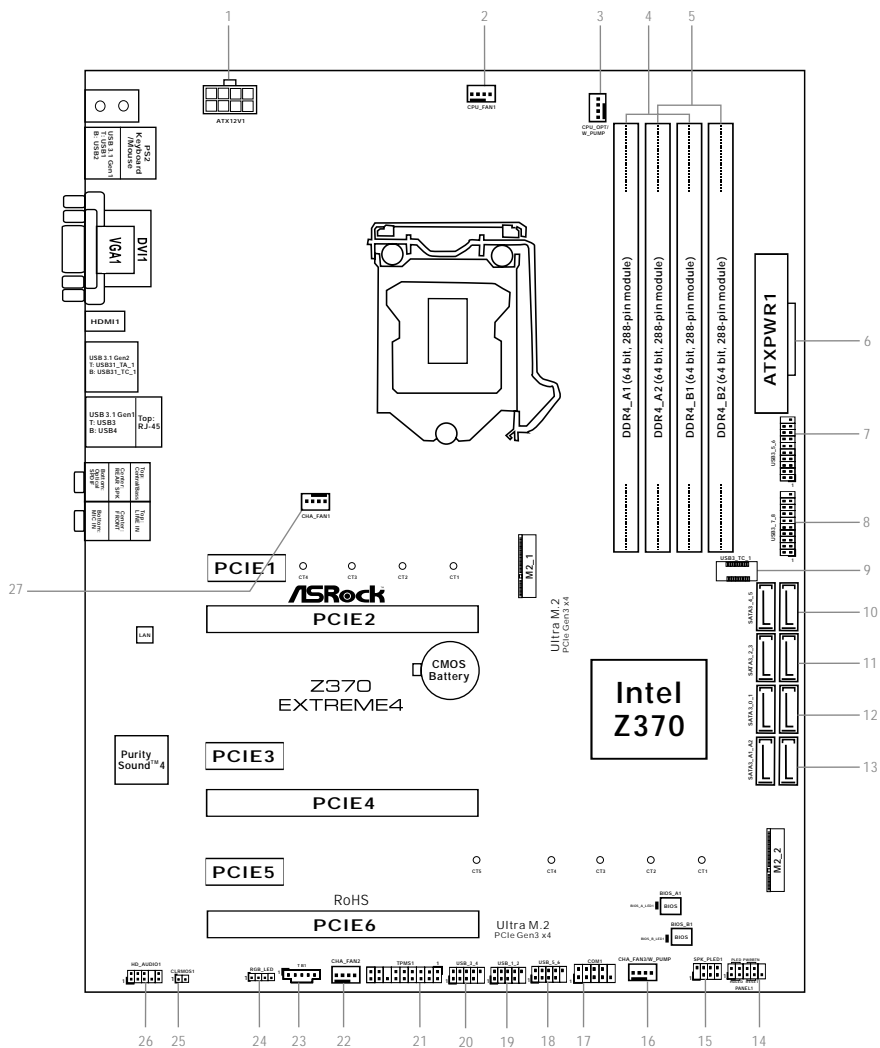
*

<http://www.asrock.com>



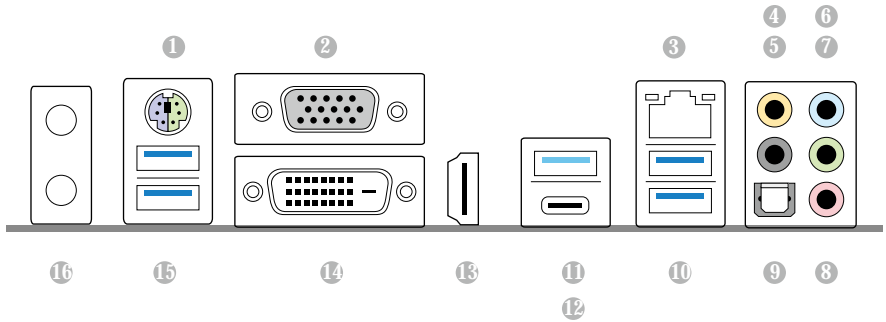
BIOS

1.3



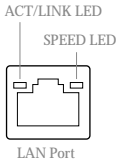
1	ATX 12V	ATX12V1		
2	CPU	CPU_FAN1		
3	CPU	/	(CPU_OPT/W_PUMP)	
4	2 x 288	DDR4 DIMM	DDR4_A1	DDR4_B1
5	2 x 288	DDR4 DIMM	DDR4_A2	DDR4_B2
6	ATX	ATXPWR1		
7	USB 3.1 Gen1	USB3_5_6		
8	USB 3.1 Gen1	USB3_7_8		
9		C USB 3.1 Gen1	USB3_TC_1	
10	SATA3	SATA3_4_5		
11	SATA3	SATA3_2_3		
12	SATA3	SATA3_O_1		
13	SATA3	SATA3_A1_A2		
14		PANEL1		
15	LED	(SPK_PLED1)		
16		/	(CHA_FAN3/W_PUMP)	
17	COM	COM1		
18	USB 2.0	USB_5_6		
19	USB 2.0	(USB_1_2)		
20	USB 2.0	USB_3_4		
21	TPM	TPMS1		
22		CHA_FAN2		
23	Thunderbolt AIC	TB1		
24	RGB LED	(RGB_LED)		
25	CMOS	CLRMOS1		
26		HD_AUDIO1		
27		CHA_FAN1		

1.4 I/O



1	PS/2 / (PS2_KB1)	9	SPDIF
2	D-Sub	10	USB 3.1 Gen1 (USB3_34)
3	LAN RJ-45 *	11	USB 3.1 Gen2 Type-A USB31_TA_1
4	/	12	USB 3.1 Gen2 Type-C USB31_TC_1
5		13	HDMI
6		14	DVI-D
7	**	15	USB 3.1 Gen1 USB3_12
8		16	

* LAN 2 LED LAN LED



/ LED		LED	
			10Mbps
			100Mbps
			1Gbps

** 2

	No. 7	No. 5	No. 4	No. 6
2	V	--	--	--
4	V	V	--	--
6	V	V	V	--
8	V	V	V	V



Mixer

2CH 4CH 6CH

Primary output Realtek HDA

/

Audio 2nd output Realtek HDA

Mixer ToolBox

Enable playback multi-streaming
ok
Realtek HDA

8CH Realtek HDA

2

ATX

•

/

•

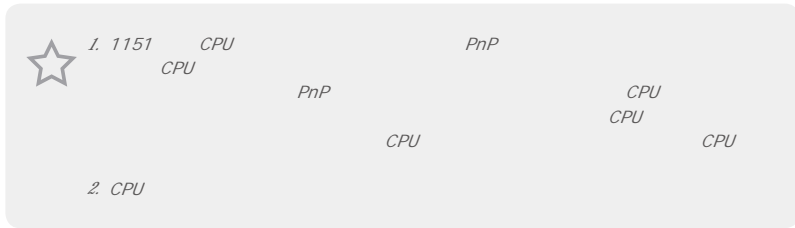
•

•

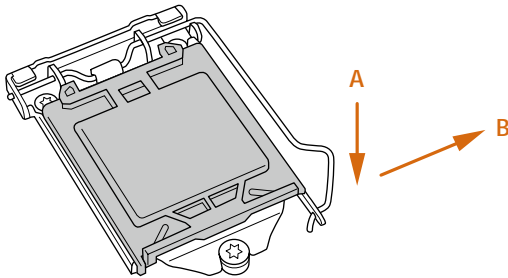
•

IC

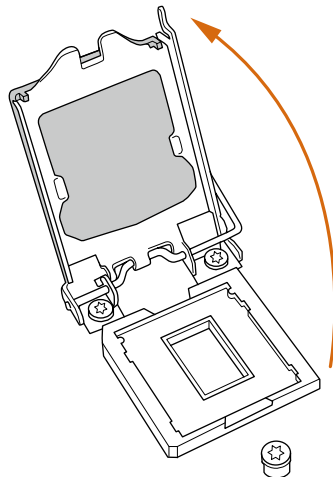
2.1 CPU



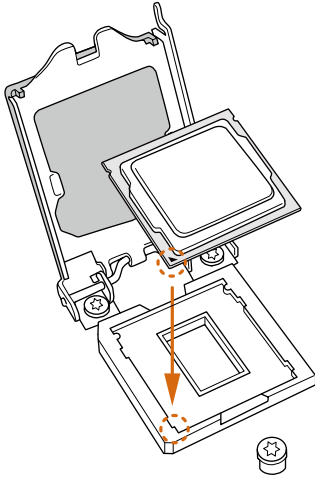
1



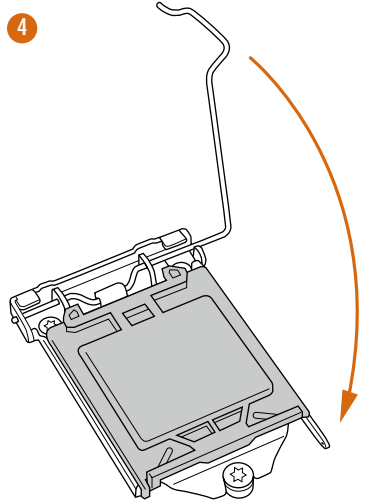
2



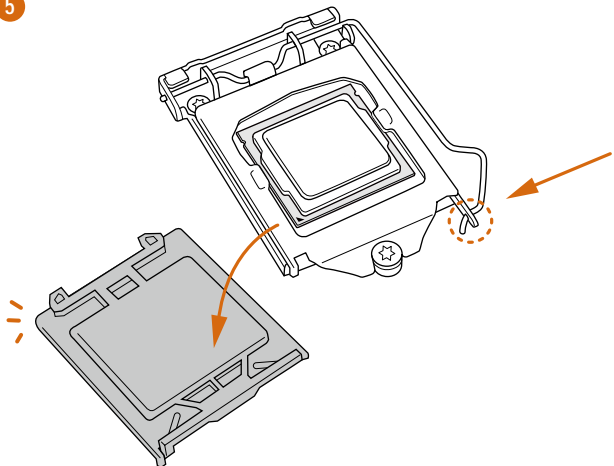
3



4

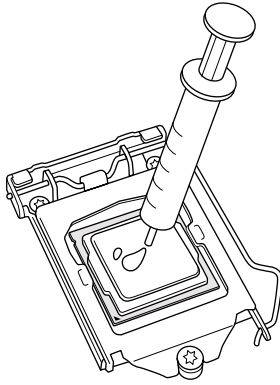


5

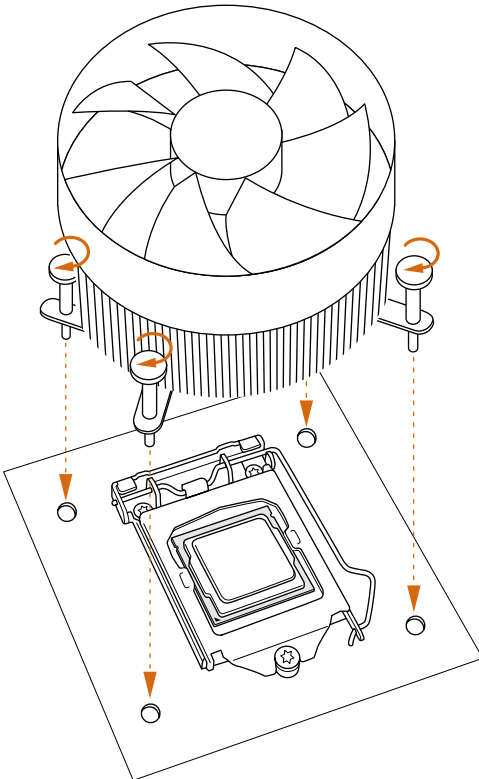




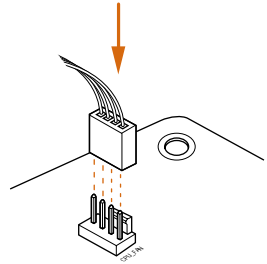
2.2 CPU



1



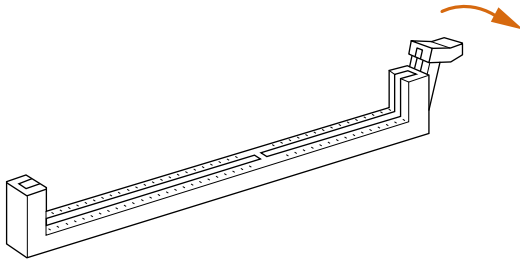
2



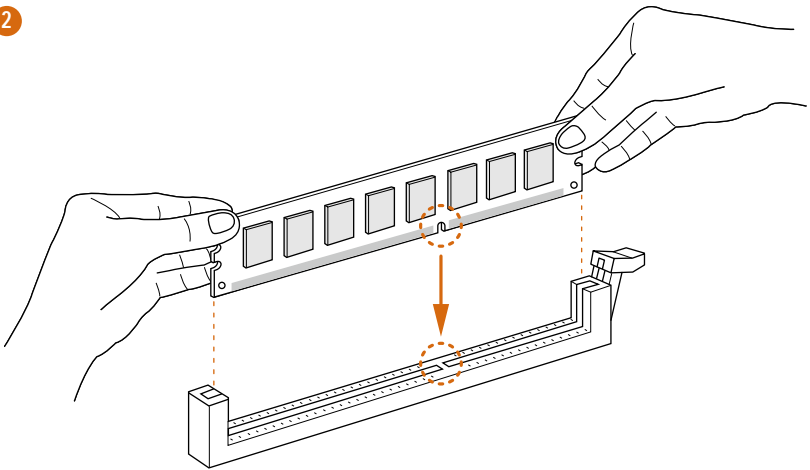
2.3

(DIMM)

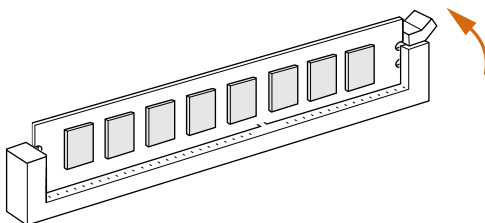
1



2



3

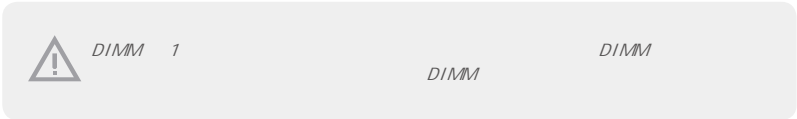


4 288 DDR4 (4)

DIMM

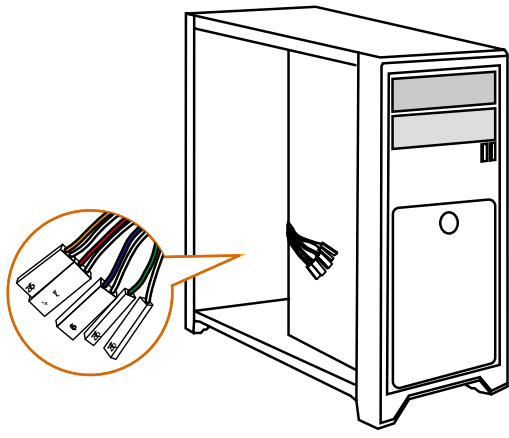


	DDR4_A1	DDR4_A2	DDR4_B1	DDR4_B2
1				
2				

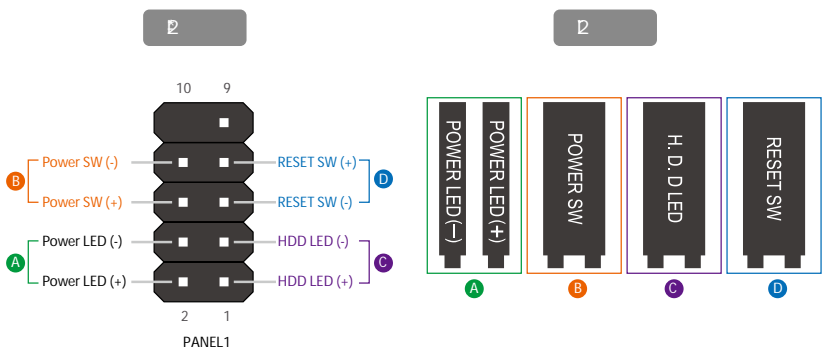
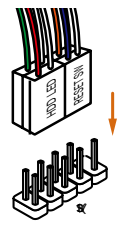


2.4

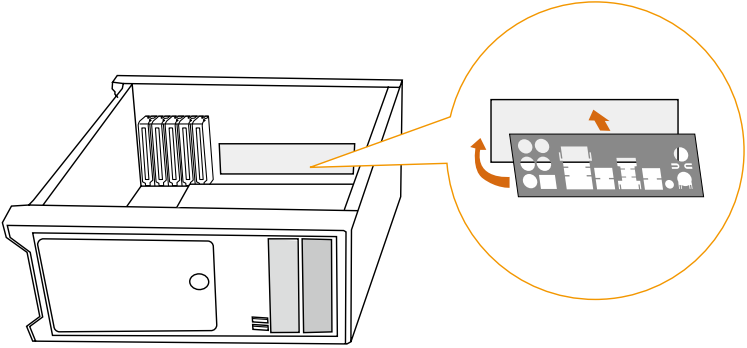
1



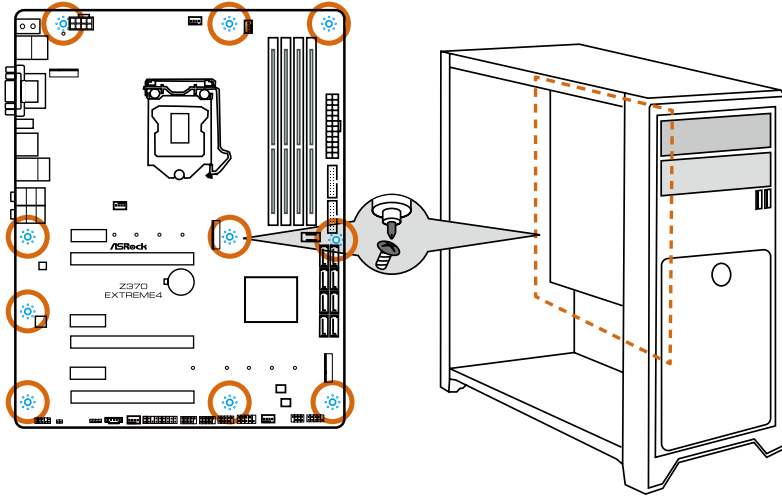
2



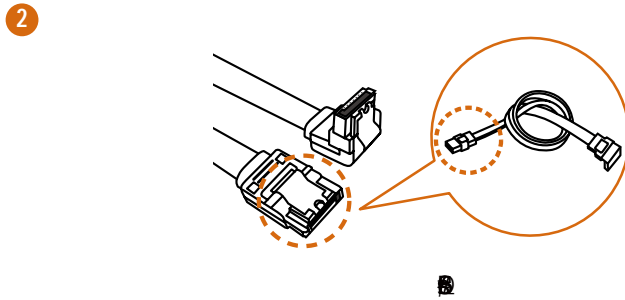
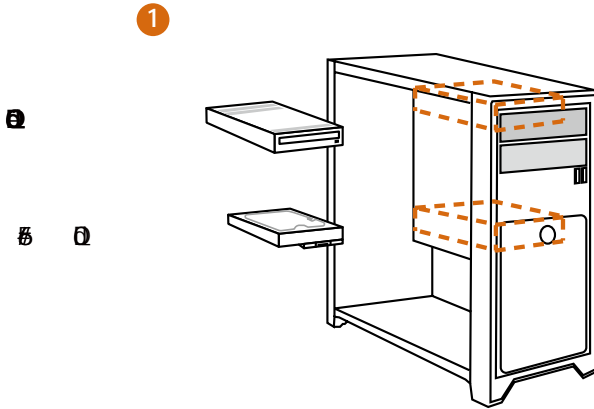
2.5 I/O



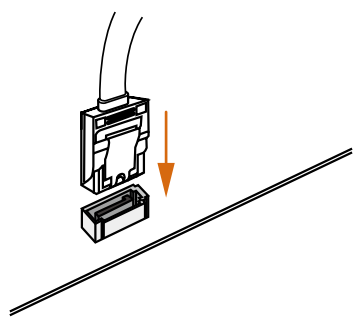
2.6



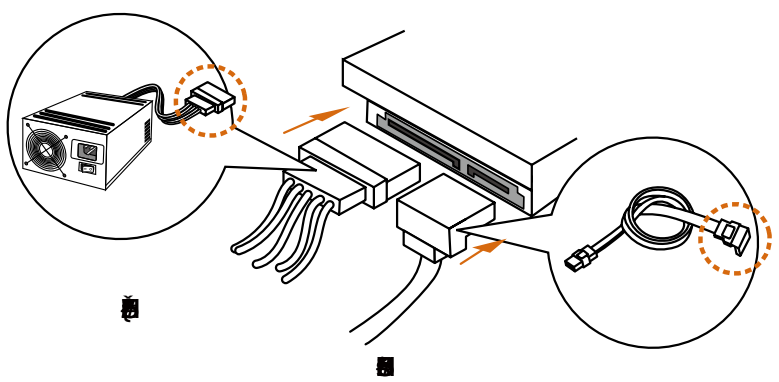
2.7 SATA



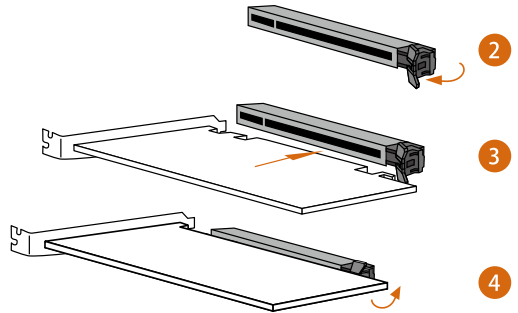
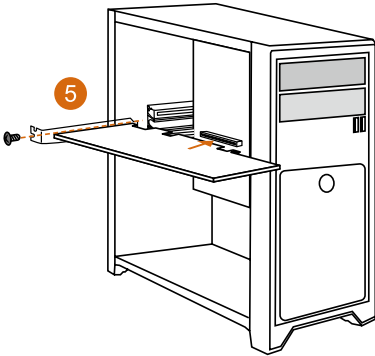
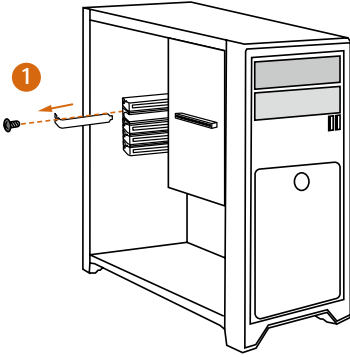
3



4



2.8



(PCI Express)

6 PCI Express



PCIe :

- PCI E1 (PCIe 3.0 x1) PCI Express x1
- PCI E2 (PCIe 3.0 x16) PCI Express x16
- PCI E3 (PCIe 3.0 x1) PCI Express x1
- PCI E4 (PCIe 3.0 x16) PCI Express x8
- PCI E5 (PCIe 3.0 x1) PCI Express x1
- PCI E6 (PCIe 3.0 x16) PCI Express x4

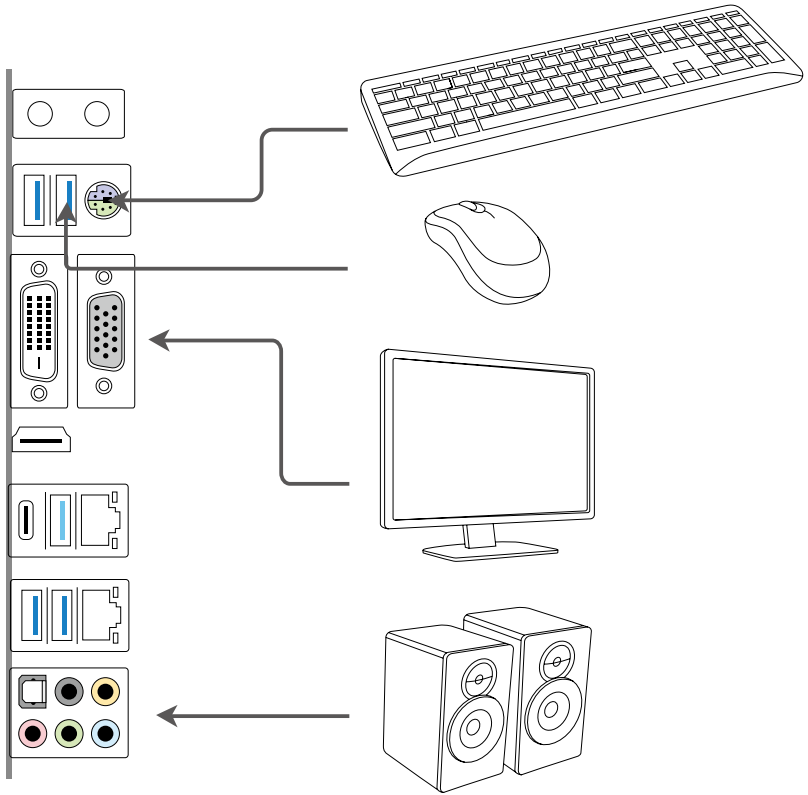
		PCI E2	PCI E4	PCI E6
		x16	N/A	N/A
CrossFireX™ 2	SLI™	x8	x8	N/A
3	CrossFireX™	x8	x8	x4
3				



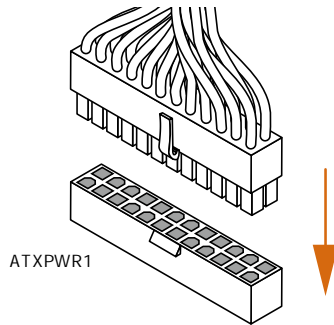
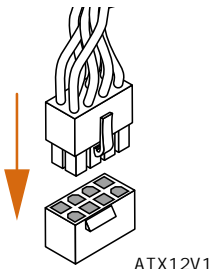
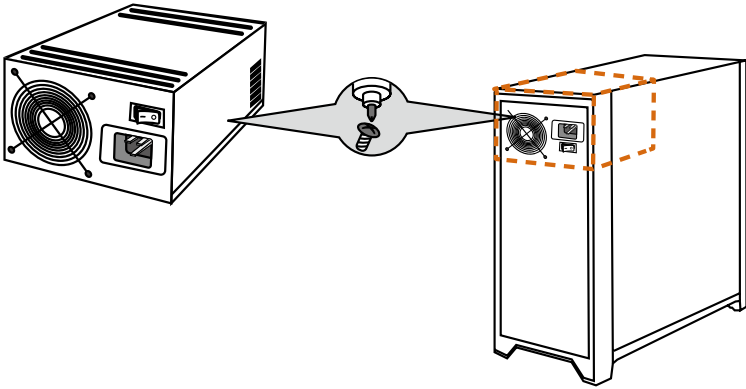
CHA_FAN3)

(CHA_FAN1 CHA_FAN2

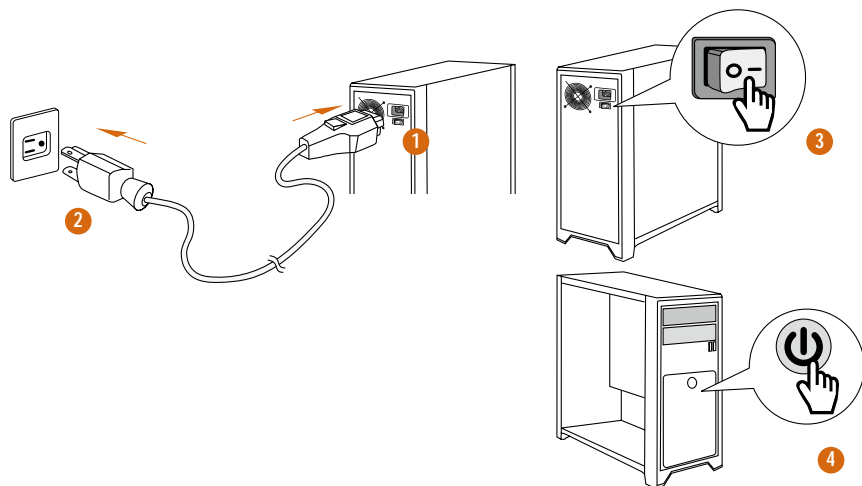
2.9



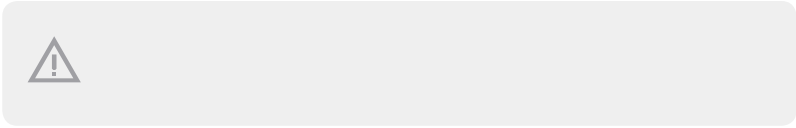
2.10



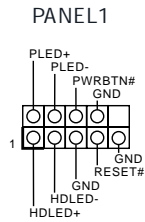
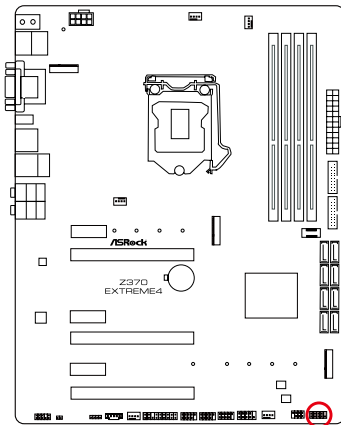
2.11



2.13



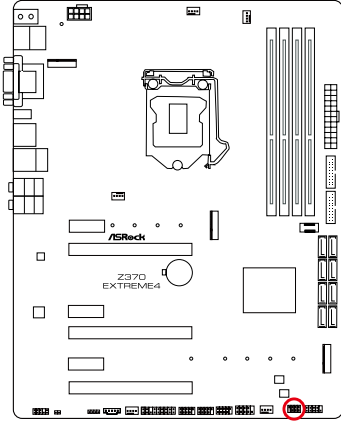
9 PANEL1 p.8 No. 14



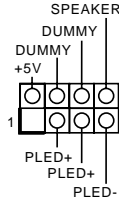
LED

7 SPK_PLED1 p.8 No. 15

LED



SPK_PLED1



ATA3

p.8 No. 10-13

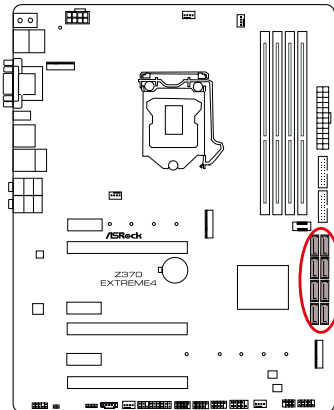
8 SATA3

6.0Gb/s
SATA

* M2_1 SATA3_0 SATA3_1

* M2_2 SATA3_4 SATA3_5

* Intel® Z370 SATA (SATA3_0)



SATA3_A1 SATA3_0 SATA3_2 SATA3_4

SATA3_A2 SATA3_1 SATA3_3 SATA3_5

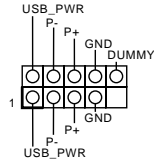
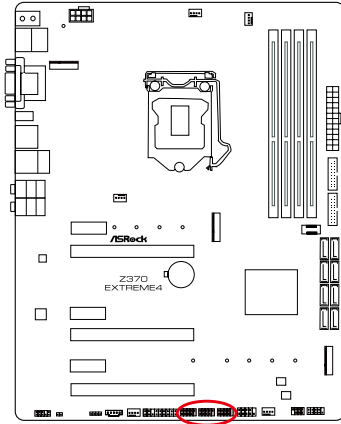
USB 2.0

p.8 No. 18-20

3

USB 2.0

2



USB 3.1 Gen1

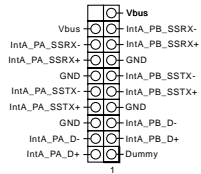
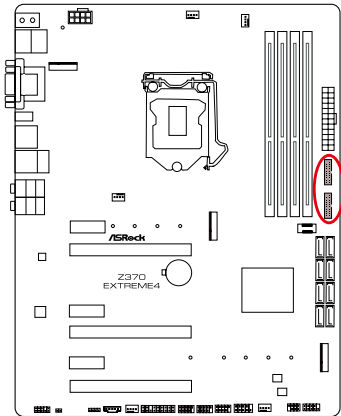
p.8 No. 7 8

2

USB 3.1

Gen1

2



C USB 3.1 Gen1

(26 F_USB3_TC_1)

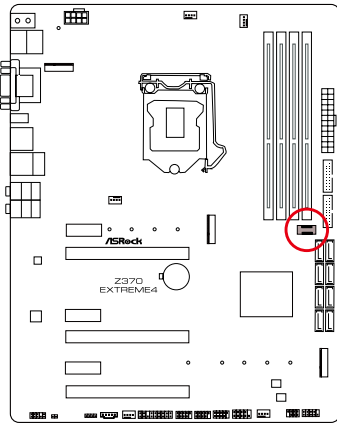
p.8 No. 9

1

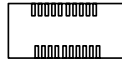
C USB 3.1 Gen1

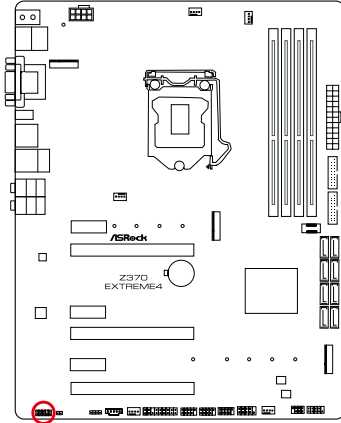
USB 3.1 Gen1

USB 3.1 Gen1

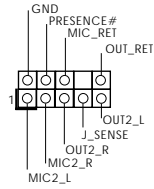


F_USB3_TC_1





HD_AUDIO1



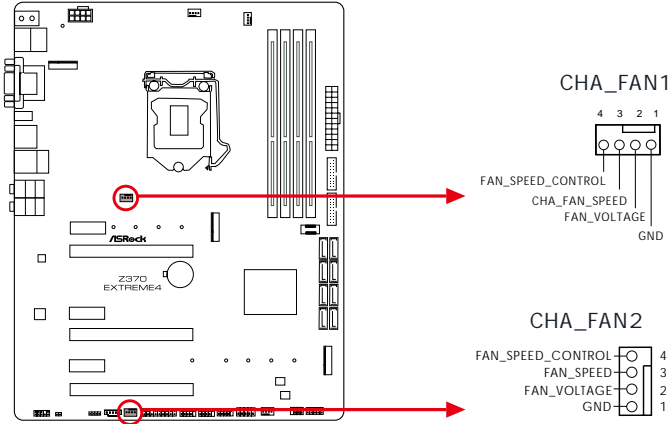
1.

HDA

2. AC'97

- A. Mic_IN MIC MIC2_L
- B. Audio_R RIN OUT2_R Audio_L LIN OUT2_L
- C. GND GND GND
- D. MIC_RET OUT_RET HD AC97
- E. Realtek FrontMic

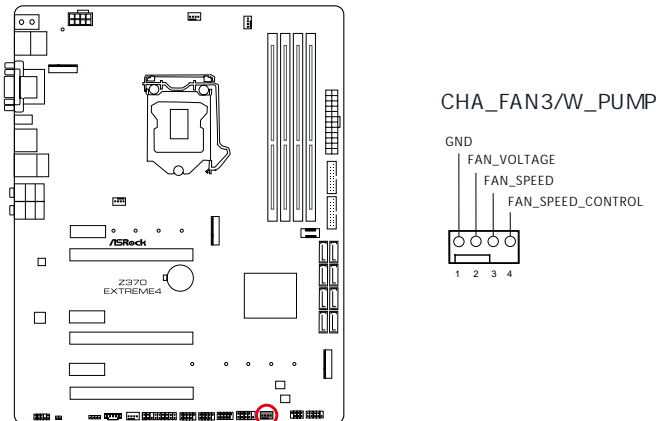
- 4 CHA_FAN1 p.8 No. 27
- 4 CHA_FAN2 p.8 No. 22



- 4 CHA_FAN3(W_PUMP) p.8 No. 16

3

1-3



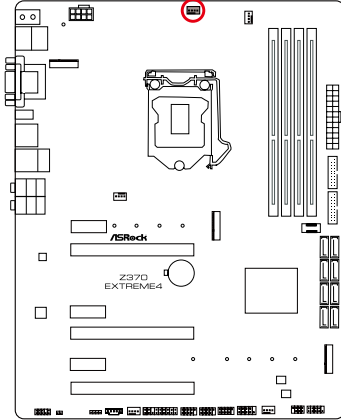
CPU

4 CPU_FAN1 p.8 No. 2

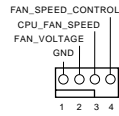
4 CPU

3 CPU

1-3



CPU_FAN1



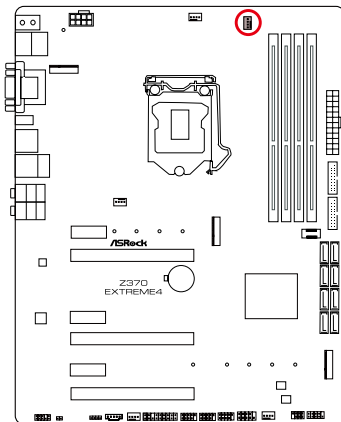
CPU

4 CPU_OPT/W_PUMP p.8 No. 3

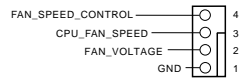
4 CPU

3 CPU

1-3



CPU_OPT/W_PUMP



ATX

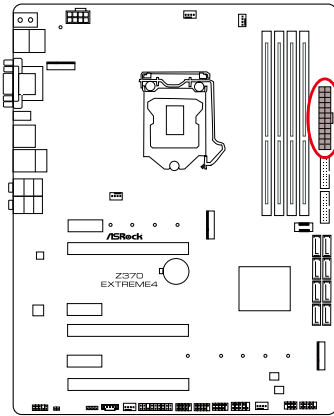
24 ATXPWR1 p.8 No. 6

24 ATX

20

ATX

1 13



ATXPWR1

12 24

1 13

ATX 12V

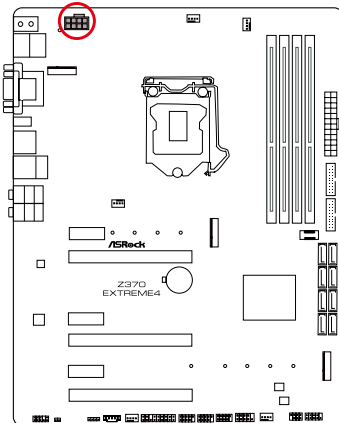
8 ATX12V1 p.8 No. 1

8 ATX12V

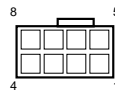
4

ATX

1 5



ATX12V1



Thunderbolt AIC

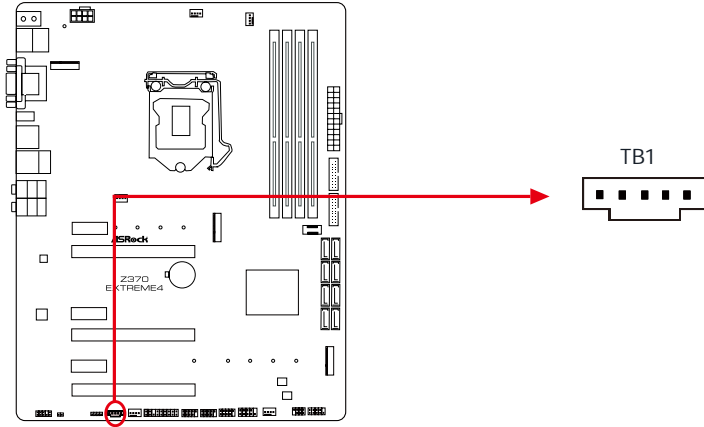
5 TB1 p.8 No. 23

GPIO Thunderbolt™ AIC Thunderbolt

AIC

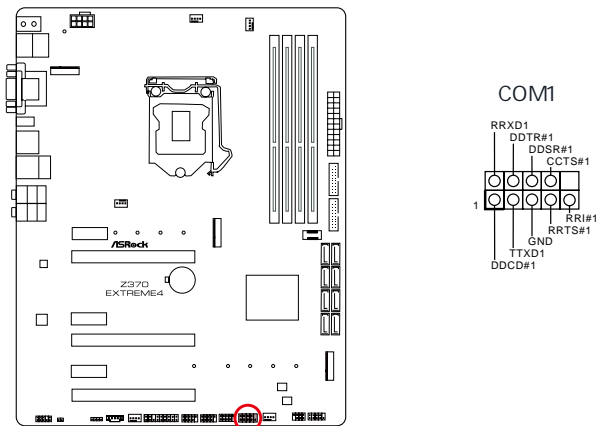
*PCIe6

Thunderbolt™ AIC



9 COM1 p.8, No. 17

COM1

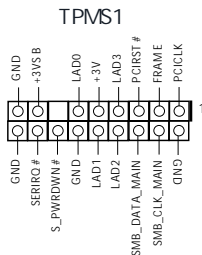
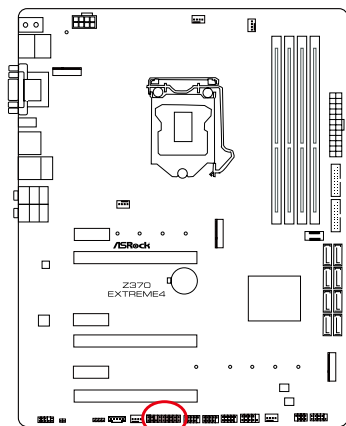


TPM

17 TPMS1 p.8, No. 21

TPM

TPM



RGB LED

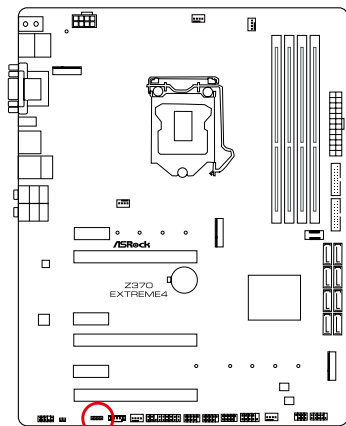
4 RGB_LED p.8, No. 24

RGB RGB LED

LED

: RGB LED

*



65

RGB_LED



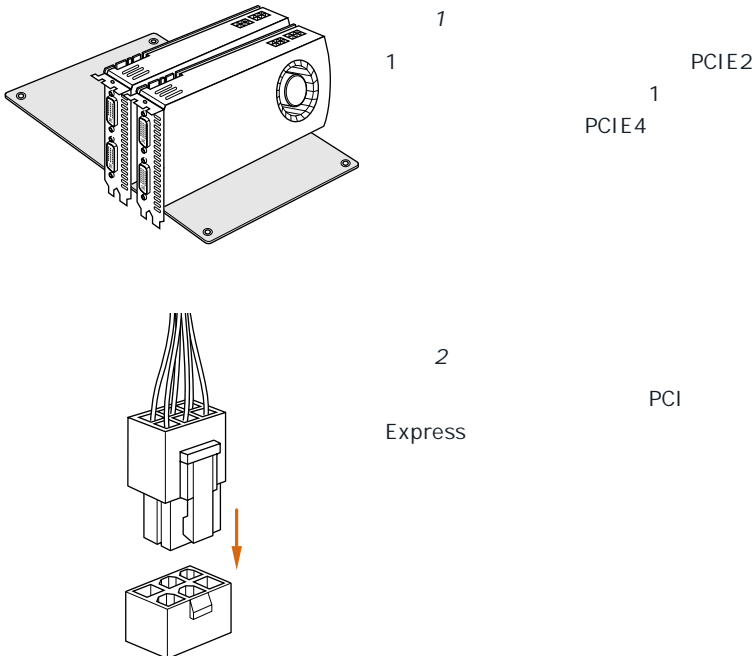
2.14 SLI™

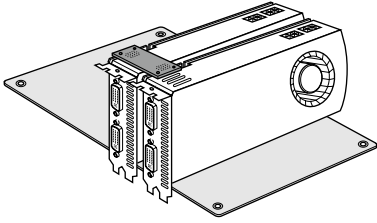
SLI™

	NVIDIA® SLI™	SLI™ Scalable Link
Interface		
x16		2 PCI Express



2.14.1 2 SLI™





3

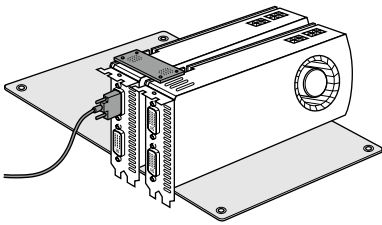
ASRock SLI_HB_Bridge_2S

ASRock

SLI_HB_Bridge_2S



ASRock SLI_HB_Bridge_2S



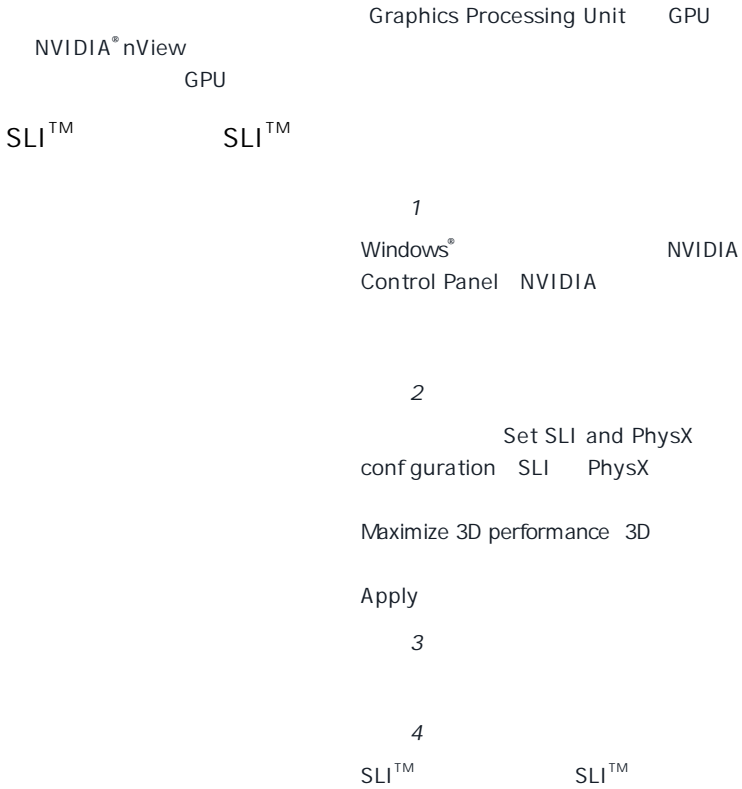
4

VGA
PCIE2

DVI

DVI

2.14.2



2.15 CrossFireX™ 3 CrossFireX™

CrossFireX™

CrossFireX™ 3
3 CrossFireX™ PCI Express x16

★ 1. AMD CrossFireX™

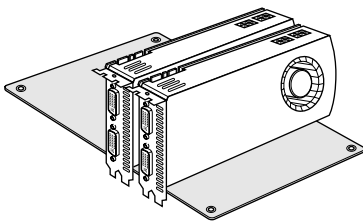
2. AMD CrossFireX™

3. www.amd.com PSU AMD PSU

4. 12 AMD CrossFireX™ CrossFireX™ 16 12

5. CrossFireX™ CrossFireX™ AMD

2.15.1 2 CrossFireX™

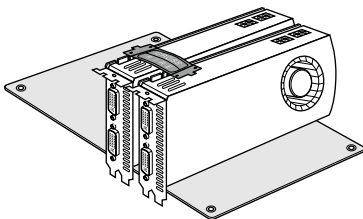


1
1
PCIE2
1
PCIE4

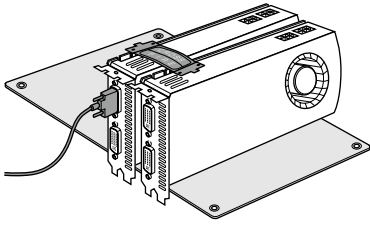


CrossFire

2
CrossFire
CrossFire



2
CrossFire



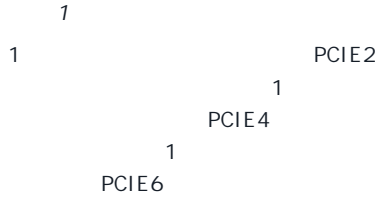
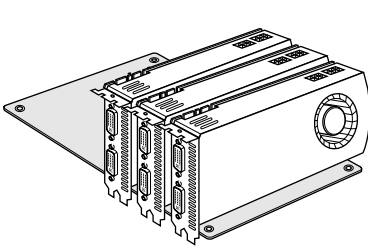
3

VGA
PCI E2

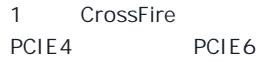
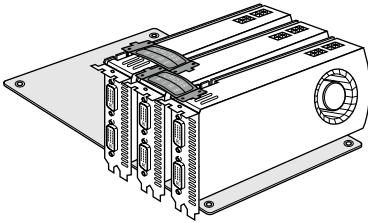
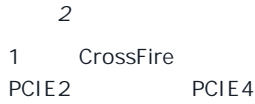
DVI

DVI

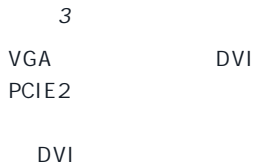
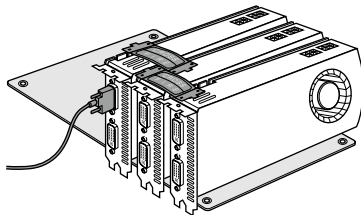
2.15.2 3 CrossFireX™



CrossFire



CrossFire



2.15.3

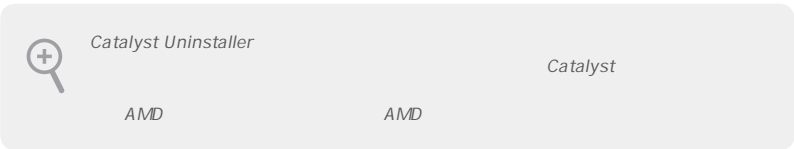
1

OS

2

VGA

AMD



3

AMD

4

AMD Catalyst Control Center
AMD

Windows®
Catalyst Control Center AMD AMD

5

Performance

AMD CrossFireX™
Enable AMD CrossFireX AMD
CrossFireX
Apply

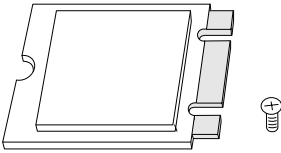
GPU

Apply

2.16 M.2 WiFi/BT (M2_3)

M.2 (E) 2230 WiFi/BT

WiFi/BT



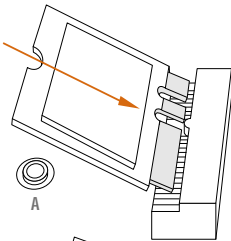
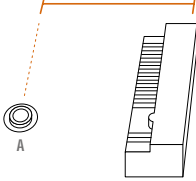
1

2230 WiFi/BT



2

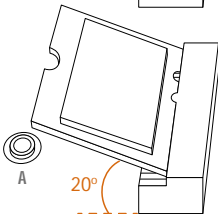
Module Type: Type2230
PCB Length: 3cm

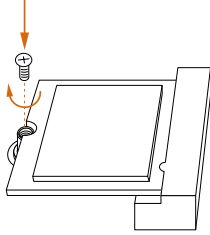


3

WiFi/BT
M.2

1





2.17 M.2_SSD (NGFF) (M2_1 and M2_2)

M.2 Next Generation Form Factor NGFF
mPCIe and mSATA

M.2 M2_1 M2_2 SATA3 6.0
Gb/s Gen3 x4 (32 Gb/s) M.2 PCI Express

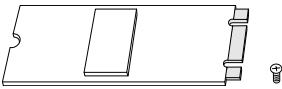
* M2_1 SATA3_0 SATA3_1

* M2_2 SATA3_4 SATA3_5

M.2_SSD (NGFF)

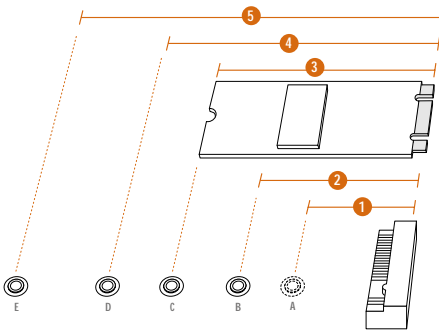
M.2_SSD (NGFF)

M2_2



1

M.2_SSD (NGFF)

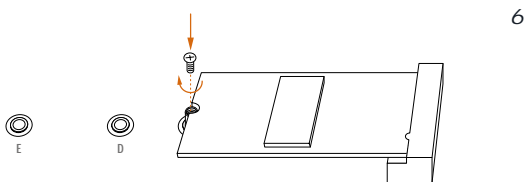
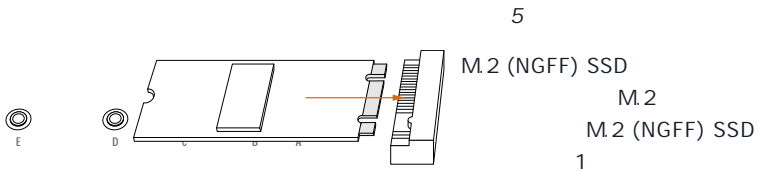
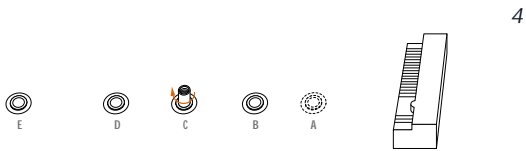
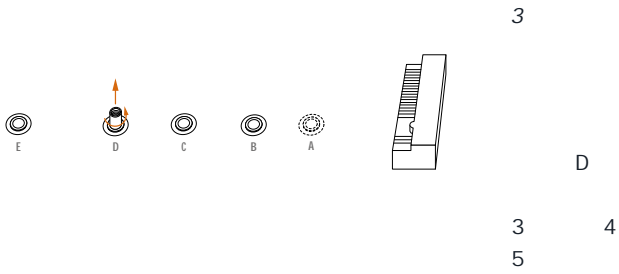


2

PCB

M.2_SSD (NGFF)

	1	2	3	4	5
PCB	A	B	C	D	E
Length	3cm	4.2cm	6cm	8cm	11cm
Type	Type2230	Type 2242	Type2260	Type 2280	Type 22110



M.2_SSD (NGFF)

ADATA	SATA3	AXNS330E-32GM-B
ADATA	SATA3	AXNS381E-128GM-B
ADATA	SATA3	AXNS381E-256GM-B
ADATA	SATA3	ASU800NS38-256GT-C
ADATA	SATA3	ASU800NS38-512GT-C
ADATA	PCIe3 x4	ASX7000NP-128GT-C
ADATA	PCIe3 x4	ASX8000NP-256GM-C
ADATA	PCIe3 x4	ASX7000NP-256GT-C
ADATA	PCIe3 x4	ASX8000NP-512GM-C
ADATA	PCIe3 x4	ASX7000NP-512GT-C
Apacer	PCIe3 x4	AP240GZ 280
Corsair	PCIe3 x4	CSSD-F240GBMP500
Crucial	SATA3	CT120M500SSD4
Crucial	SATA3	CT240M500SSD4
Intel	SATA3	Intel SSDSCKGW080A 401/80G
Intel	PCIe3 x4	SSDPEKKF256G7
Intel	PCIe3 x4	SSDPEKKF512G7
Kingston	SATA3	SM2280S3
Kingston	PCIe3 x4	SKC1000/480G
Kingston	PCIe2 x4	SH2280S3/480G
OCZ	PCIe3 x4	RVD400 -M2280-512G (NVME)
PATRIOT	PCIe3 x4	PH240GPM280SSDR NVME
Plextor	PCIe3 x4	PX-128M8PeG
Plextor	PCIe3 x4	PX-1TM8PeG
Plextor	PCIe3 x4	PX-256M8PeG
Plextor	PCIe3 x4	PX-512M8PeG
Plextor	PCIe	PX-G256M6e
Plextor	PCIe	PX-G512M6e
Samsung	PCIe3 x4	SM961 MZVPW128HEGM (NVM)
Samsung	PCIe3 x4	PM961 MZVLW128HEGR (NVME)
Samsung	PCIe3 x4	960 EVO (MZ-V6E250) (NVME)
Samsung	PCIe3 x4	960 EVO (MZ-V6E250BW) (NVME)
Samsung	PCIe3 x4	SM951 (NVME)
Samsung	PCIe3 x4	SM951 (MZHPV256HDGL)
Samsung	PCIe3 x4	SM951 (MZHPV512HDGL)
Samsung	PCIe3 x4	SM951 (NVME)
Samsung	PCIe x4	XP941-512G (MZHPU512HCGL)
SanDisk	PCIe	SD6PP4M-128G
SanDisk	PCIe	SD6PP4M-256G
Team	SATA3	TM4PS4128GMC105
Team	SATA3	TM4PS4256GMC105
Team	SATA3	TM8PS4128GMC105

Team	SATA3	TM8PS4256GMC105
TEAM	PCIe3 x4	TM8FP2240GOC101
TEAM	PCIe3 x4	TM8FP2480GC110
Transcend	SATA3	TS256GMTS400
Transcend	SATA3	TS512GMTS600
Transcend	SATA3	TS512GMTS800
V-Color	SATA3	VLM100-120G-2280B-RD
V-Color	SATA3	VLM100-240G-2280RGB
V-Color	SATA3	VSM100-240G-2280
V-Color	SATA3	VLM100-240G-2280B-RD
WD	SATA3	WDS100T1BOB-00AS40
WD	SATA3	WDS240G1GOB-00RC30
WD	PCIe3 x4	WDS256G1XOC-00ENX0 (NVME)
WD	PCIe3 x4	WDS512G1XOC-00ENX0 (NVME)

M.2_SSD (NFGG)

<http://www.asrock.com>

3

3.1



3.2 A-Tuning

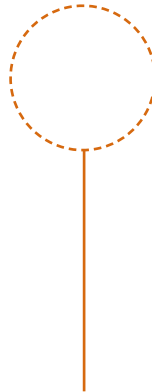
A-Tuning ASRock

3.2.1 A-Tuning

A-Tuning ASRock Live Update & APP Shop (ASRock APP)
A-Tuning
A-Tuning

3.2.2 A-Tuning

A-Tuning 6 : Operation Mode
() OC Tweaker (OC) System Info () FAN-
Tastic Tuning (FAN-Tastic) Settings ()
Operation Mode ()



ECO

OC Tweaker (OC)



Apply

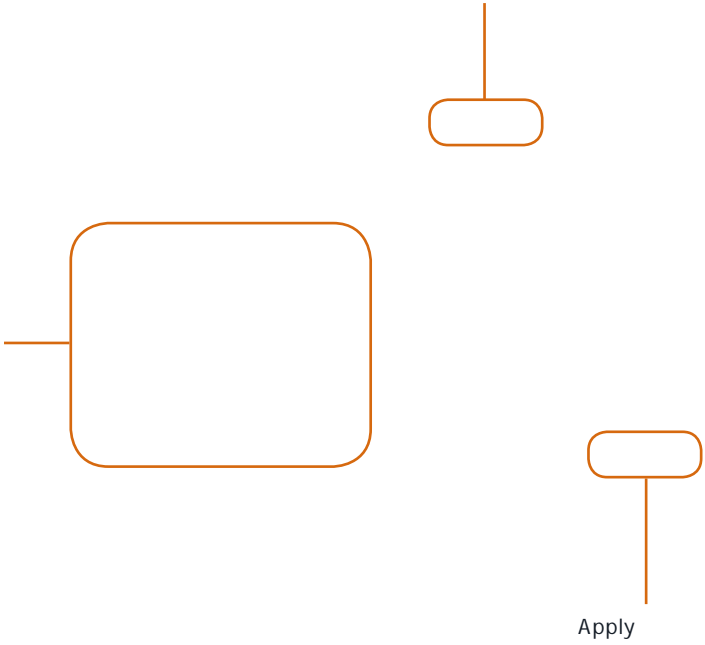
System Info ()

*



FAN-Tastic Tuning ()

5



Settings ()

ASRock A-Tuning

A-Tuning

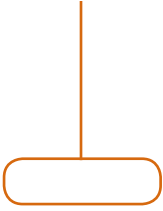
(Windows)

Windows

Auto run at Windows Startup

Setting

A-Tuning



3.3 ASRock Live Update & APP Shop ASRock APP

ASRock

APP

ASRock

ASRock APP

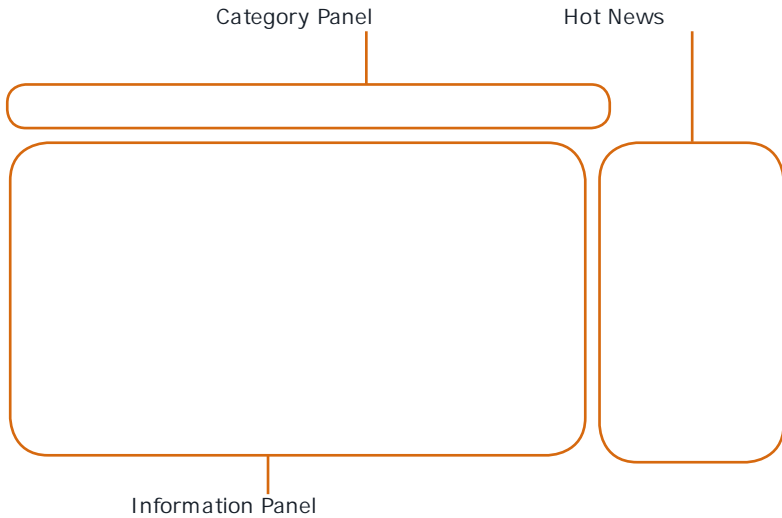
ASRock

APP

*ASRock

APP

3.3.1 UI



Category Panel

Information Panel

Hot News

3.3.2 Apps

Apps

1

-

Free

-

Installed

2

3

4

Installed

*

New Version

1

2

3.3.3 BIOS & Drivers BIOS

BIOS

BIOS & Drivers BIOS

BIOS

1

2

1

3

Update

3.3.4

Setting

Windows

ASRock

APP

ASRock RGB LED Utility

ASRock RGB LED
LED
RGB LED

ASRock RGB LED



RGB LED
/



RGB LED

LED
RGB LED



4 UEFI

4.1

UEFI

UEFI

<F2>

(POST)

POST

UEFI

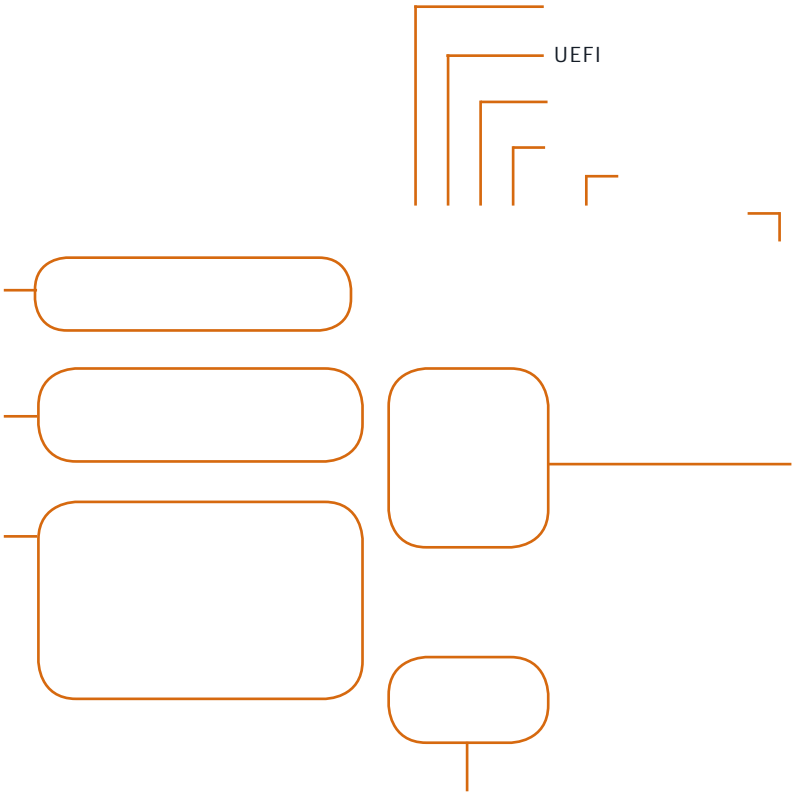
<Ctl> + <Alt> + <Delete>



UEFI

4.2 EZ Mode (EZ)

BIOS EZ Mode (EZ)
CPU DRAM
SATA
Advanced Mode ()
Mode (<F6>)] [Advanced



4.3 Advanced Mode ()

Advanced Mode () BIOS

EZ < F6 >
[EZ Mode (EZ)]

4.3.1 UEFI

Main /
()

OC Tweaker (OC
)

Advanced
()

Tool ()

H/W Monitor
(H/W
)

Boot ()

Security
(
)

Exit () UEFI

4.4 Main ()

UEFI

My Favorite ()

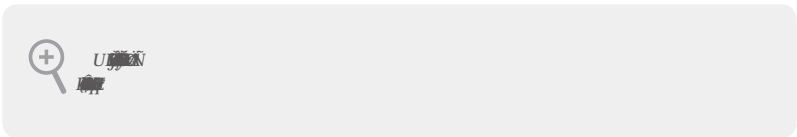
BIOS

/

F5

4.5 OC Tweaker (OC)

OC



Advanced Turbo ()

CPU
K- CPU

Load Optimized CPU OC Setting (CPU OC)

CPU
CPU

Load Optimized GPU OC Setting (GPU OC)

GPU
GPU

K- CPU

CPU Configuration (CPU)

Multi Core Enhancement ()
CPU CPU

CPU Ratio (CPU)
CPU CPU BCLK CPU CPU

CPU Cache Ratio (CPU)
CPU CPU

Minimum CPU Cache Ratio CPU
CPU

BCLK Frequency BCLK
CPU CPU BCLK BCLK
CPU

Spread Spectrum ()
EMI

CPU BCLK Amplitude CPU BCLK
CPU BCLK

CPU Slew Rate (CPU)
CPU

CPU PLL ORT
CPU PLL ORT

Divider
BCLK

Boot Performance Mode
OS Max Non-Turbo Max Battery
cpu Flex-

OS CPU 8
BCLK

Reliability Stress Restrictor

FCLK Frequency FCLK

FCLK

AVX Ratio Of set AVX

AVX Ratio Of set AVX
Ratio CPU

AVX

CPU
AVX SSE

AVX

BCLK Aware Adaptive Voltage BCLK

BCLK Aware Adaptive Voltage BCLK
CPU V/F
BCLK

pcode BCLK /

Ring to Core Ratio Of set

Ring to Core Ratio Of set

Intel SpeedStep Technology Intel SpeedStep

Intel SpeedStep

Intel Turbo Boost Technology

Intel Speed Shift Technology

Intel Speed Shift Technology

/

CPPC v2

P

Long Duration Power Limit ()
[Configure Package Power Limit 1] (1)
CPU
CPU

Long Duration Maintained ()
[Long Duration Power Limit] () CPU

Short Duration Power Limit ()
[Configure Package Power Limit 2] (2)
CPU
CPU

CPU Core Current Limit CPU
CPU CPU

GT Slice Current Limit GT
GT CPU

GT Frequency GT
GPU

DRAM Configuration (DRAM)
DRAM Tweaker (DRAM)
/ DRAM
[OK]

DRAM Timing Configuration (DRAM)

Load XMP Setting (XMP)
XMP

BCLK Frequency BCLK
 CPU CPU BCLK BCLK
 CPU

DRAM Frequency Clock DRAM
 [Auto] ()

DRAM Frequency (DRAM)
 [Auto] ()

Primary Timing

CAS# Latency (tCL) (CAS# (tCL))

RAS# to CAS# Delay RAS# CAS# Row
 Precharge (tRCDtRP)

RAS# to CAS# Delay RAS# CAS# :

Row Precharge :

RAS# Active Time (tRAS) (RAS# (tRAS))

Command Rate (CR) ((CR))

Secondary Timing

Write Recovery Time (tWR) ((tWR))

Refresh Cycle Time (tRFC) ((tRFC))

RAS to RAS Delay (tRRD_L) (RAS RAS (tRRD_L))

RAS to RAS Delay (tRRD_S) (RAS RAS (tRRD_S))
2

Write to Read Delay (tWTR_L) (
(tWTR_L))

Write to Read Delay (tWTR_S) (
(tWTR_S))

Read to Precharge (tRTP) (
(tRTP))

Four Activate Window (tFAW) (4
(tFAW))

1 4

CAS Write Latency (tCWL) (CAS (tCWL))
CAS

Third Timing 3
tREFI

tCKE

DDR4

1

tRDRD_sg

tRDRD_dg

tRDRD_dr

tRDRD_dd

tRDWR_sg

tRDWR_dg

tRDWR_dr

tRDWR_dd

tWRRD_sg

tWRRD_dg

tWRRD_dr

tWRRD_dd

tWRWR_sg

tWRWR_dg

tWRWR_dr

tWRWR_dd

Fourth Timing (4)

RTL Init Value

IO-L Init Value	IO		
IO		IO	
RTL (CH A)			
A			
RTL (CH B)			
B			
IO-L (CH A)			
A	IO		
IO-L (CH B)			
B	IO		
IO-L Of set (CH A)	IO		
A			
A	IO		
IO-L Of set (CH B)	IO		
B			
B	IO		
RFR Delay (CH A)	RFR		A
A	RFR		
RFR Delay (CH B)	RFR		B
B	RFR		
Advanced Setting			
ODT WR (CH A)			
A		WR	
ODT WR (CH B)			
B		WR	
ODT PARK (CH A)			
A		PARK	
ODT PARK (CH B)			
B		PARK	

ODT NOM (CH A)

ODT (CH A) Auto/Manual /
[Auto] ()

ODT NOM (CH B)

ODT (CH B) Auto/Manual /
[Auto] ()

DII Bandwidth 0 DII 0
DII 0

DII Bandwidth 1 DII 1
DII 1

DII Bandwidth 2 DII 2
DII 2

DII Bandwidth 3 DII 3
DII 3

Command Tristate

Command Tristate Support

Realtime Memory Timing

Realtime Memory Timing

[Enabled] MRC_DONE

MRC Fast Boot (MRC)
DRAM

Voltage Configuration ()

CPU Core/Cache Voltage CPU /
CPU /

CPU Load-Line Calibration (CPU
)

CPU

GT Core/Cache Voltage GT /
CPU /

GT Load-Line Calibration (GT)

GPU Load-Line Calibration GPU
GPU

DRAM Voltage (DRAM)
DRAM [Auto]

DRAM Activating Power Supply DRAM

DRAM

PCH + 1.0 Voltage PCH + 1.0
1.0V

VCCIO Voltage VCCIO
VCCIO

VCCST Voltage VCCST
VCCST

VCCSA Voltage VCCSA
VCCSA

VCCPLL Voltage VCCPLL
VCCPLL

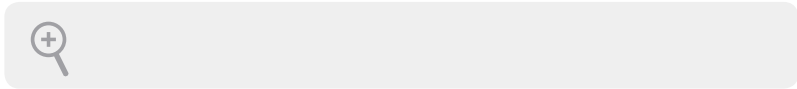
CPU Internal PLL Voltage CPU PLL
0.900V Ln2 0.015 V 9 15
CPU PLL
: 1.020V 1.125V

Vcore CPU Internal PLL Voltage CPU CPU Vcore Voltage CPU
PLL

GT PLL Voltage GT PLL
0.900V LN2 0.015 V 9 -15
CPU
PLL : 1.020V 1.125V

4.6 Advanced ()

Chipset Configuration CPU Configuration CPU
Storage Configuration,
Intel® Thunderbolt Super IO Configuration
IO ACPI Configuration ACPI USB Configuration USB
Trusted Computing



UEFI Configuration UEFI

UEFI

UEFI

Active Page on Entry ()

UEFI

Full HD UEFI (HD UEFI)

Auto()

1920 x 1080

HD

1024 x 768

HD

Disable()

1024 x 768

4.6.1 CPU Configuration (CPU)

Active Processor Cores ()

CPU C States Support (CPU C)
CPU C C3 C6
C7

Enhanced Halt State (C1E) ((C1E))

CPU C3 State Support (CPU C3)

CPU C6 State Support (CPU C6)

CPU C7 State Support (CPU C7)

Package C State Support (C
)
CPU PCIe C

CFG Lock (CFG)

CFG Lock (CFG)

CPU Thermal Throttling (CPU)

CPU CPU

Intel Virtualization Technology (Intel Virtualization)

Intel Virtualization

Hardware Prefetcher ()

Adjacent Cache Line Prefetch ()

Software Guard Extensions (SGX)

Software Controlled Software Guard Extensions
SGX

4.6.2 Chipset Configuration ()

Primary Graphics Adapter ()

VGA

Top of Lower Usable Dram
Dram

TOLUD

Dynamic

TOLUD

MMIO

Above 4G Decoding 4G

Above 4G Address Space 4G

64
PCI

VT-d

I/O

Intel® Virtualization Technology for Directed

I/O (VT-d)

I/O

PCIe1 Link Speed (PCIe1)

PCIe1

PCIE2 Link Speed (PCIE2)
PCIE2

PCIE3 Link Speed (PCIE3)
PCIE3

PCIE4 Link Speed PCIE4
PCIE4

PCIE5 Link Speed PCIE5
PCIE5

PCIE6 Link Speed (PCIE6)
PCIE6

PCI Express Native Control PCI Express

OS PCI Express

PCIE ASPM Support PCIE ASPM

CPU ASPM
/

PCH PCIE ASPM Support PCH PCIE ASPM

PCH PCIE ASPM /

DMI ASPM Support DMI ASPM

DMI CPU ASPM /

PCH DMI ASPM Support PCH DMI ASPM

PCH DMI ASPM /

IOAPIC 24-119 Entries IOAPIC 24-119

IOAPIC 24-119 / IRQ24-119 PCH

Share Memory ()

IGPU Multi-Monitor (IGPU)

Intel(R) Ethernet Connection I219-V Intel(R)
I219-V

Intel® I219V

Onboard HD Audio (HD)

HD / [Auto] ()
HD

Front Panel ()

HD /

Onboard HDMI HD Audio (HDMI HD)

WAN Radio WAN

WiFi

Deep Sleep ()

Restore on AC/Power Loss (AC/)

[Power Of]

[Power On]

Turn On LED in S5 (S5 LED)
ACPI S5 LED /

4.6.3 Storage Configuration ()

SATA Controller(s) (SATA)

SATA /

SATA Controller Speed SATA

SATA

SATA Mode Selection (SATA)

[AHCI]

[Intel RST Premium (RAID)]

SATA Aggressive Link Power Management (SATA)

SATA

AHCI

Hard Disk S.M.A.R.T. (S.M.A.R.T.)

S.M.A.R.T Self-Monitoring () Analysis ()
Reporting () Technology ()

ASMedia SATA3 Mode (ASMedia SATA3)

[AHCI]

Third Party SATA 3 Controller (SATA
3)

SATA3

M2_1/SATA3_0_1 Switch M2_1/SATA3_0_1

[Auto] M2_1/SATA3_0_1

[Force _SATA] SATA3_0_1

[Force _M2_1] M2_1

M2_2/ SATA3_4_5 M2_2/ SATA3_4_5

[Auto] M2_2/SATA3_4_5

[Force _SATA] SATA3_4_5

[Force _M2_1] M2_2

4.6.4 Intel® Thunderbolt

Intel® Thunderbolt Technology (Intel® Thunderbolt)

Intel® Thunderbolt™ /

Security Level

Thunderbolt

AR AIC Support AR AIC

AR AIC

TBT Host Router TBT

4.6.6 ACPI Configuration (ACPI)

Suspend to RAM (RAM)

ACPI S1 [Auto] ()

ACPI HEPT Table (ACPI HEPT)

PS/2 Keyboard Power On (PS/2)

PS/2

[Disabled]

PS/2 Keyboard Power On PS/2

[Any Key]

PS/2

PCIE/PCI Devices Power On PCIE/PCI

PCIE/PCI

LAN

Wake-On-

I219 LAN Power On I219 LAN

I219 LAN

Ring-In Power On (RI)

COM RI

RTC Alarm Power On (RTC)

[Disabled] RTC Alarm Power On RTC

[Enabled] RTC Alarm Power On RTC

USB Keyboard/Remote Power On (USB /)

USB

USB Mouse Power On (USB)

USB

4.6.7 USB Configuration (USB)

Legacy USB Support (USB)
USB 2.0 OS / USB

[Enabled ()]
OS) USB Legacy OS (

[Disabled ()]
OS) USB Legacy OS (

[UEFI Setup Only (UEFI)]
Windows/Linux UEFI
USB

PS/2 Simulator (PS/2)
I/O 60h/64h
USB OS USB

XHCI Hand-off (XHCI)
XHCI OS ()

XHCI [Disabled ()] XHCI

[Enabled ()] XHCI BIOS XHCI

[Disabled ()] XHCI XHCI XHCI

Third Party USB 3.1 Controller (USB3.1)

USB3.1 Gen2

/

4.6.8 Trusted Computing

Security Device Support (

)
BIOS

4.7 Tools ()

RGB LED

RGB LED
PC

LED

UEFI Tech Service (UEFI)

PC

ASRock

[UEFI Tech Service] (UEFI)

Easy RAID Installer (RAID)

CD USB

RAID

SATA

RAID

RAID

Boot Manager ()
Boot Manager () OS / OS

* 1

Boot Manager ()
/

Boot Manager Timeout ()
/

Timeout Seconds ()

Instant Flash ()
UEFI USB [Instant Flash ()]
UEFI

Internet Flash () - DHCP ()
IP) AUTO ()
ASRock [Internet Flash] ()
UEFI [Internet Flash]
()

* BIOS

USB

Secure Backup UEFI (

UEFI)

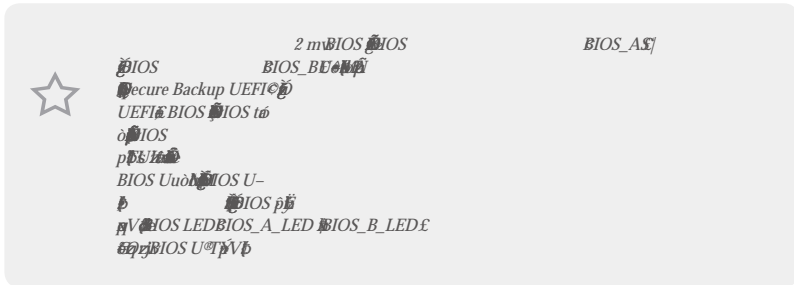
ROM 1

ROM

UEFI

ROM

ROM



Network Configuration ()

[Internet Flash] ()

Internet Setting ()

/

UEFI Download Server (UEFI)
UEFI

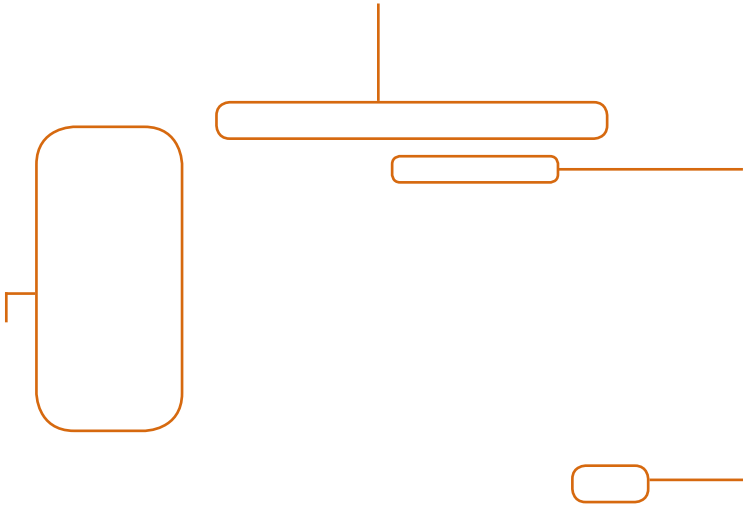
4.8 Hardware Health Event Monitoring ()

CPU

Fan Tuning ()

Fan-Tastic Tuning ()

5



CPU Fan 1 Setting (CPU 1)

CPU 1 CPU [Customize ()]

:
[Customize ()] [Silent Mode ()]
[Standard Mode ()] [Performance Mode ()] [Full
Speed ()]

CPU Fan Step Up (CPU)

CPU Fan Step Up (CPU)
[0 Sec (0)]

CPU Fan Step Down (CPU)

CPU Fan Step Down (CPU)
[0 Sec (0)]

CPU_OPT / W_Pump

CPU

CPU Optional Fan Control Mode (CPU)

CPU PWM DC

[DC Mode (DC)] 3

[PWM Mode (PWM)] 4

CPU Optional Fan Setting (CPU)

CPU Customize ()
5 CPU

[Customize ()] [Silent Mode ()] [Standard Mode ()] [Performance Mode ()] [Full Speed ()]

CPU Optional Fan Temp Source (CPU)

CPU

[Monitor CPU (CPU)] CPU

[Monitor M/B ()]

CPU Optional Fan Step Up (CPU)

CPU Optional Fan Step Up (CPU)
[0 Sec (0)]

CPU Optional Fan Step Down (CPU)

CPU Optional Fan Step Down (CPU)
[0 Sec (0)]

Chassis Fan 1 Setting (1)

1

[Customize ()]

)] 5 CPU

[Customize ()] [Silent Mode ()] [Standard Mode ()] [Performance Mode ()] [Full Speed ()]

Chassis Fan 1 Temp Source (1)
1

[Monitor CPU (CPU)] CPU

[Monitor M/B ()]

Chassis Fan 1 Step Up (1)

Chassis Fan 1 Step Up (1)
[0 Sec (0)]

Chassis Fan 1 Step Down (1)

Chassis Fan 1 Step Down (1)
[0 Sec (0)]

Chassis Fan 2 Setting (2)
2

)] 5 CPU [Customize (

[Customize ()] [Silent Mode ()]
[Standard Mode ()] [Performance Mode ()] [Full Speed ()]

Chassis Fan 2 Temp Source (2)
2

[Monitor CPU (CPU)] CPU

[Monitor M/B ()]

Chassis Fan 2 Step Up (2)

Chassis Fan 2 Step Up (2)
[0 Sec (0)]

Chassis Fan 2 Step Down (2)

Chassis Fan 2 Step Down (2)
[0 Sec (0)]

CHA_FAN3 / W_PUMP

CHA_FAN3/CPU

Chassis Fan 3 Control Mode (3)

3 PWM DC
[DC Mode (DC)] 3
[PWM Mode (PWM)] 4

Chassis Fan 3 Setting (3)

3 [Customize ()]
5 CPU

[Customize ()] [Silent Mode ()]
[Standard Mode ()] [Performance Mode ()] [Full
Speed ()]

Chassis Fan 3 Temp Source (3)

3
[Monitor CPU (CPU)] CPU

[Monitor M/B ()]

Chassis Fan 3 Step Up (3)

Chassis Fan 3 Step Up (3)
[0 Sec (0)]

Chassis Fan 3 Step Down (3)

Chassis Fan 3 Step Down (3)
[0 Sec (0)]

Over Temperature Protection ()

4.9 Security ()

Supervisor Password () UEFI

<Enter>

User Password () UEFI

<Enter>

Secure Boot ()
Windows 8.1 /

Intel(R) Platform Trust Technology (Intel(R))

ME Intel PTT / TPM

Full Screen Logo ()

POST

AddOn ROM Display (ROM)

Screen Logo (ROM) [Full ROM

Boot Failure Guard Message ()

CSM: Compatibility Support Module (CSM)

CSM

[Compatibility Support Module ()]

WHCK

Windows 8.1 64-

CSM

UEFI

Launch PXE OpROM Policy (PXE OpROM)
[UEFI only (UEFI)] UEFI ROM

[Legacy only ()]
ROM

[Do not launch ()]
ROM UEFI ROM

Launch Storage OpROM Policy (OpROM)

[UEFI only (UEFI)] UEFI ROM

[Legacy only ()]
ROM

[Do not launch ()]
ROM UEFI ROM

Launch Video OpROM Policy (OpROM)

[UEFI only (UEFI)] UEFI ROM

[Legacy only ()]
ROM

[Do not launch ()]
ROM UEFI ROM

4.11 Exit ()

Save Changes and Exit ()
Save configuration changes and exit
setup? ()
UEFI
[OK]

Discard Changes and Exit ()
Discard changes and exit setup? ()
UEFI
[OK]

Discard Changes ()
Discard changes? ()
[OK]

Load UEFI Defaults (UEFI)
<F9>

Launch EFI Shell from filesystem device ()
EFI

shellx64.efi

EFI

ASRock

ASRock

ASRock

<http://www.asrock.com>

<http://www.asrock.com/support/tsd>.

asp

ASRock Incorporation

2F., No.37, Sec.2, Jhongyang S. Rd., Beitou District,

Taipei City 112, Taiwan R.O.C.

ASRock EUROPE B.V.

Bijsterhuizen 11-11

6546 AR Nijmegen

The Netherlands

Phone: + 31-24-345-44-33

Fax: + 31-24-345-44-38

ASRock America, Inc.

13848 Magnolia Ave, Chino, CA91710

U.S.A.

Phone: + 1-909-590-8308

Fax: + 1-909-590-1026