

ECM-6103

COM-Express Type6 核心板
USER' Manual V10

USER'S MANUAL 用户手册

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安全须知

1	产品使用前，务必仔细阅读产品说明书。
2	对未准备安装的板卡，应将其保存在防静电保护袋中。
3	在从包装袋中拿板卡前，应将手先置于接地金属物体上一会儿，以释放身体及手中的静电。
4	在拿板卡时，需佩带静电保护手套，并且应该养成只触及边缘部份的习惯。
5	主板与电源连接时，请确认电源电压。
6	为避免人本被电击或产品被损坏，在每次对主板、板卡进行拔插或生新配置时须先关闭交流电源或将交流电源线从电源插座中拔掉。
7	在对板卡进行搬动前，先将交流电源线从电源插座中拔掉。
8	当您需连接或拔除任何设备前，须确定所有的电源线事先已被拔掉。
9	为避免频繁开关机对产品造成不必要的损伤,关机后,应至少等待30秒后再开机。
10	设备在使用过程时出现异常情况，请找专业人员处理。

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第一章 产品介绍

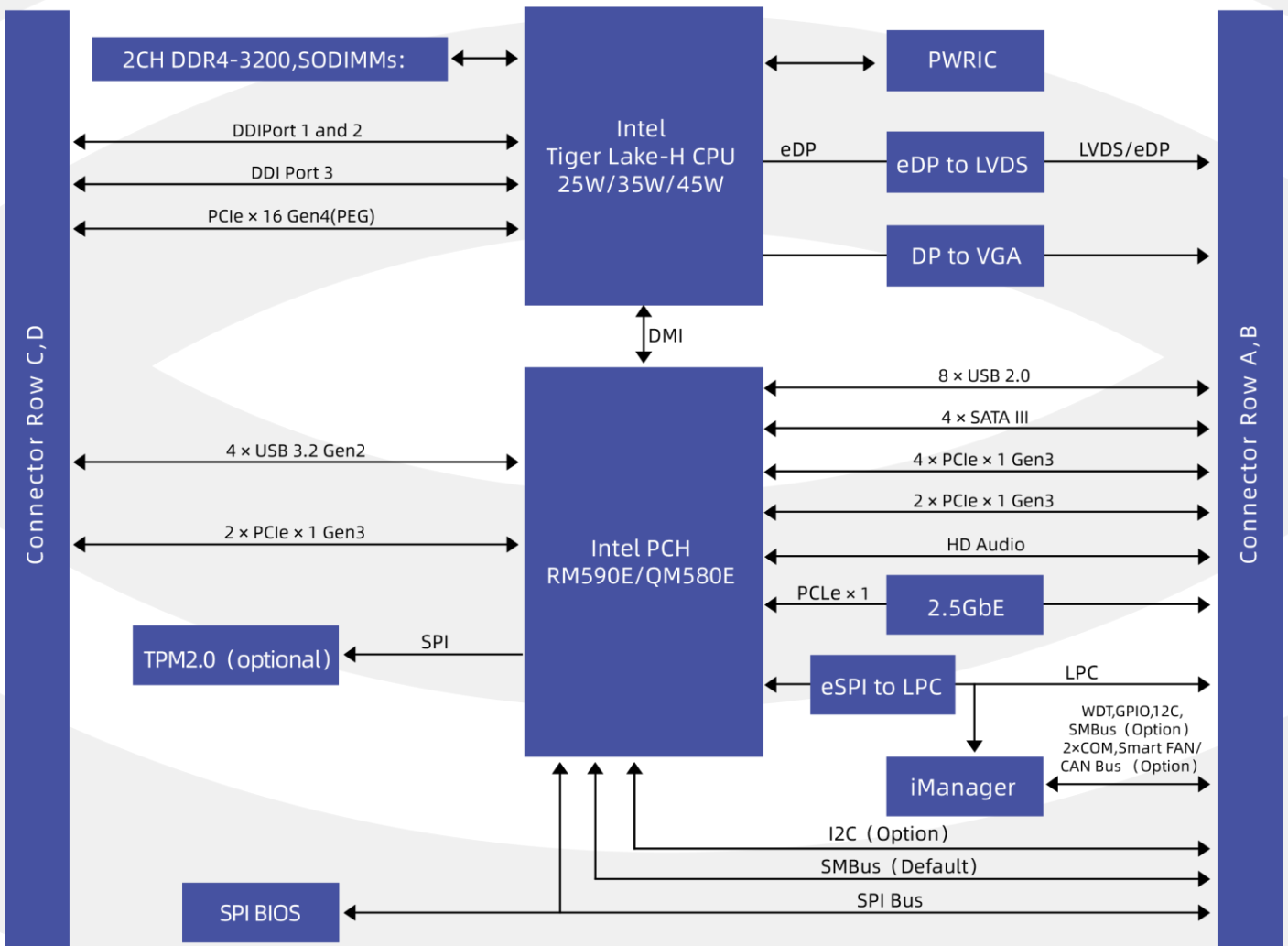
1.1 产品规格

Model		ECM-6103		
配置 Item	规格 Specification	描述 Describe		
处理器 Processor System	处理器 CPU	i7-11850HE	i5-11500HE	i3-11100HE
	内核数 Core Number	8	6	4
	最高主频 Max. Speed	4.7GHz	4.5GHz	4.4GHz
	二级缓存 L2 Cache	24M	12M	8M
	功耗 TDP (W)	45W	45W	45W
	芯片组 Chipset	QM580E		
	指令集 Instruction Set Extensions	SSE4.1, SSE4.2, AVX2, AVX-512		
	BIOS	AMI EFI 256Mbit		
扩展插槽 Expansion Slot	PCI Express x16	PCI Express Gen4 (8.0 GT/s) 1 路 PCIe x16 可配置成 1x16,2x8,1x8+2x4		
	PCI Express x1	PCI Express Gen3 8 路 PCIe x1,可配置成 x4 或 x2		
内存 Memory	规格 Technology	DDR4 SO-DIMM Non-ECC or ECC support by specific SKU		
	最大容量 Max. Capacity	128G 3200MHz		
	插槽 Socket	2 x SO-DIMM		
显示 Display	控制器 Controller	3 x DDI support configurable HDMI/DVI/DP 1 x DDI support configurable VGA 1 x eDP to LVDS(optional eDP)		
	分辨率 Resolution	VGA: 1920x1200@60Hz LVDS dual channel: 1920x1200@60Hz eDP: 4096 x2304@60Hz, 24bpp HDMI: 4096x2160@24Hz DVI: 1920x1200@60Hz DP: 4096x2304@60Hz		

以太网 Ethernet	控制器 Controller	Intel I225LM/IT (up to 2.5GbE)
	连接器 Connector	通过 COM-E 引出
I/O	GPIO	8-bit GPIO
	SER	2 x SER
内部接口 Internal Connector	USB 3.2	4 x USB3.2
	USB 2.0	8 x USB2.0
	音频 Audio	1 x HDA
	SATA 3.0	4 x SATA3.0
	LPC	1 x LPC
	SMBUS	1 x SMBUS
	看门狗 Watch Dog	Support
	TPM2.0	1 x TPM2.0
	其他 Others	1、 Smart Fan 2 Ports(1 port on COM module (Notice: the input voltage of fan is aligned to Vin); 1 port on carrier board) 2、支持 1 x Power button 3、支持 1 x RESET
	拓展	2 x COM-E 220Pin 连接器
电源 Power Requirements	电源类型 Power Type	ATX: VCC,VSB AT: VCC
	电源电压 Input Voltage	Supply Voltage Vin: 8.5V~20V VSB: 4.75V~5.25 V RTC Battery: 2.0V~3.3V
	连接器 Connector type	底板供电
物理特性 Physical	尺寸 Dimensions	125*95*2.0mm
	PCB 颜色 Color	Green

环境 Environment	工作温度 Operating Temperature	0~60°C
	存储温度 Storage Temperature	-40~85°C
	工作湿度 Operating Humidity	20~90%(non-condensing)
操作系统 OS	Microsoft	Windows 10 LTSC/1809(RS5)
	Linux	Red Hat 8.4 Ubuntu 20.04 Yocto 4.0xLTS

1.2 功能框图

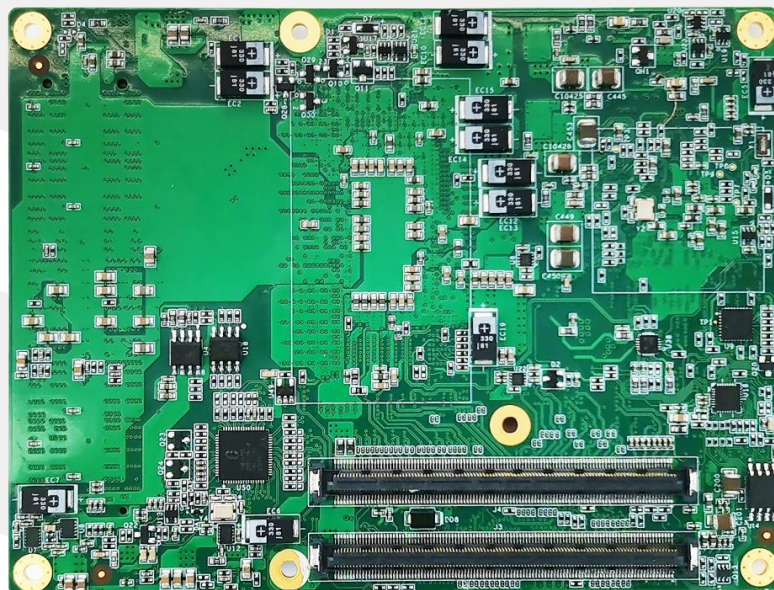
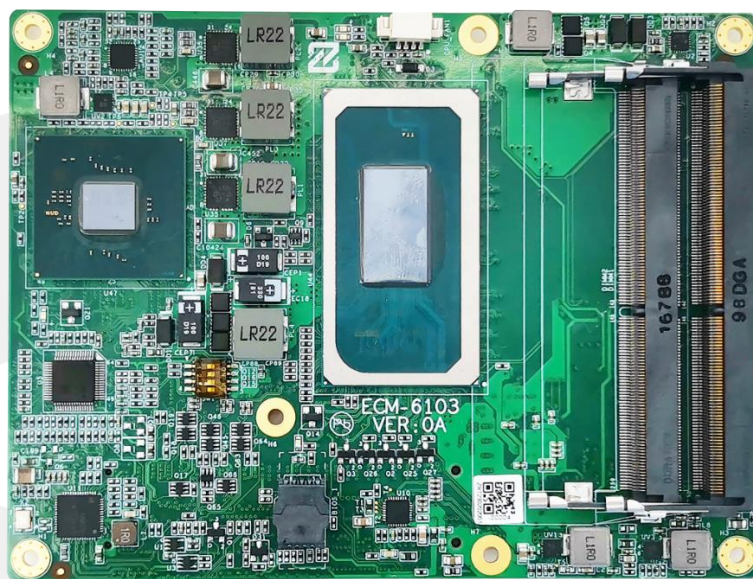


1.3 产品料号

Model	Part Number	Specification
ECM-6103	8.ZRT.80-1621-03-LFF	主板 ECM-6103,VER 1.0,COME 核心板, 11代

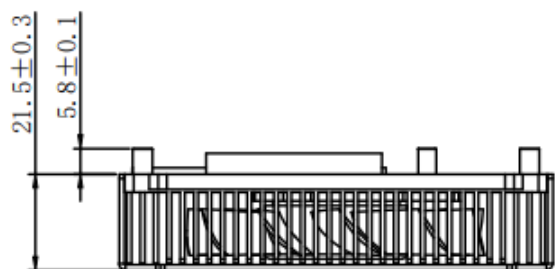
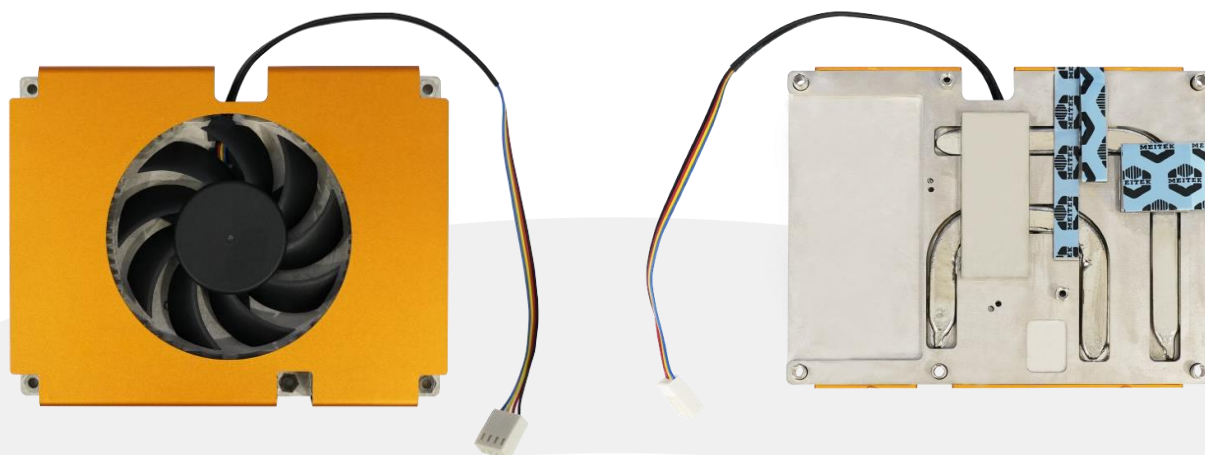
		Tigerlake-H,i3-11100HE+QM580E DDR4 SODIMM+IT8659+IT8883/主板带散热器/工包装二十入
	8.ZRT.80-1621-04-LFF	主板 ECM-6103,VER 1.0,COME 核心板, 11 代 Tigerlake-H,i5-11500H+QM580 DDR4 SODIMM+IT8659+IT8883/主板带散热器/工包装二十入
	8.ZRT.80-1621-05-LFF	主板 ECM-6103,VER 1.0,COME 核心板, 11 代 Tigerlake-H,i7-11850H+QM580 DDR4 SODIMM+IT8659+IT8883/主板带散热器/工包装二十入

1.4 产品照片

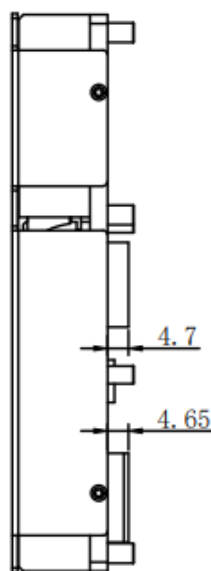
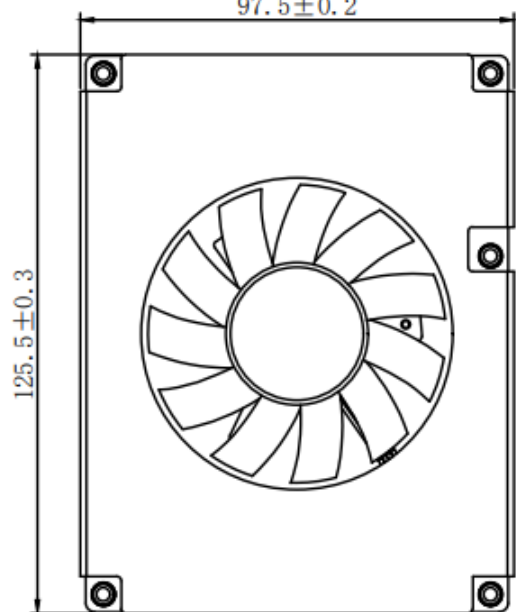


1.5 散热器

Part Number: 1.ZRT.48-6331-00-A00

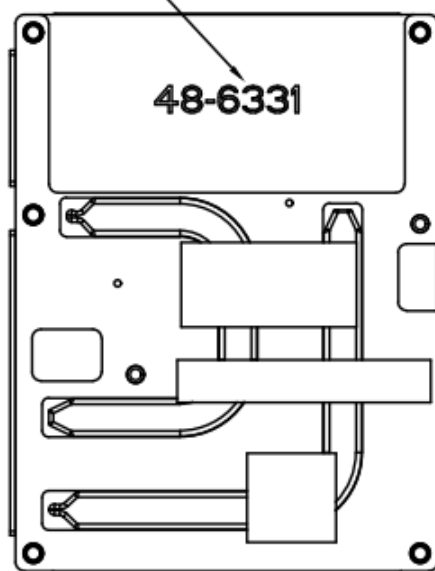


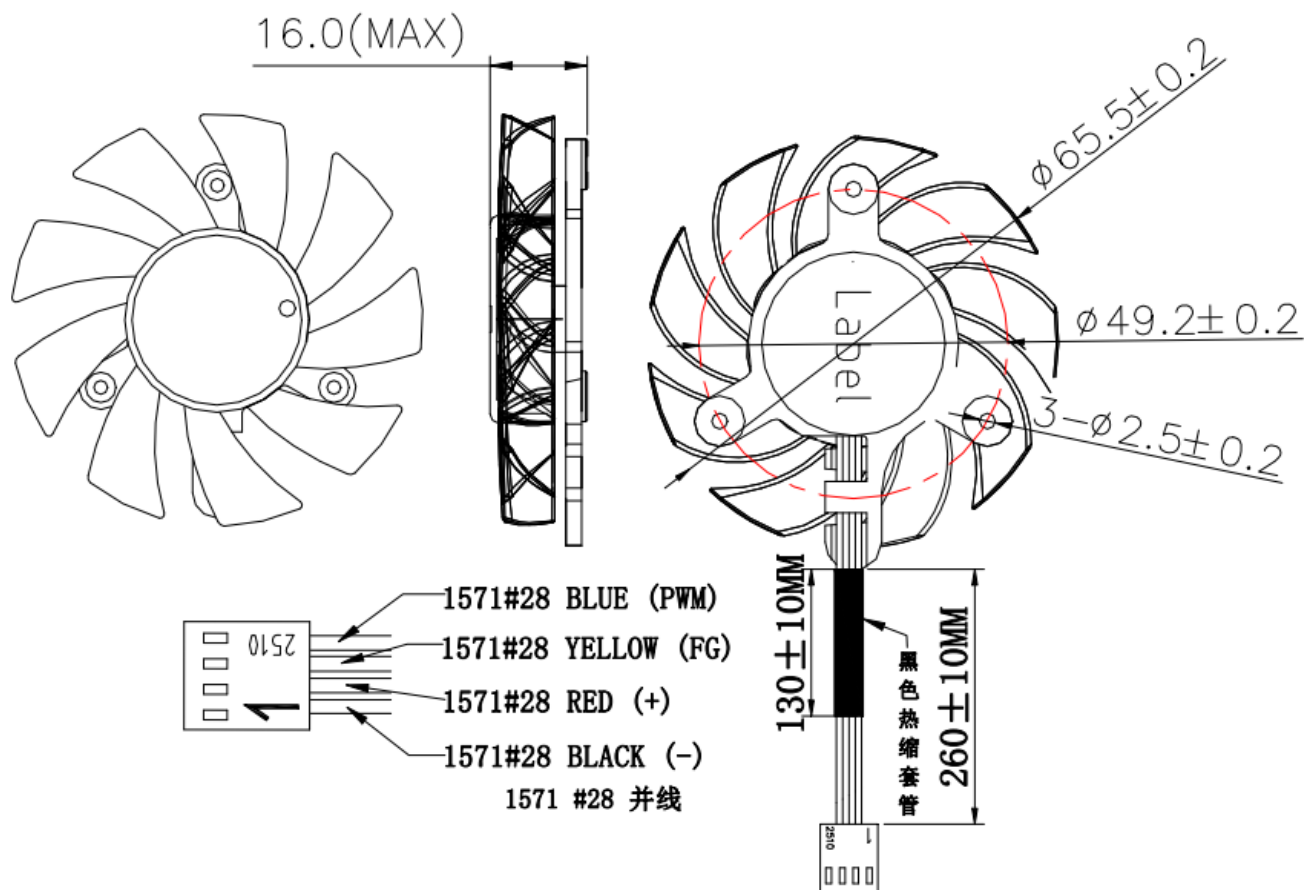
97.5 ± 0.2



标记

48-6331





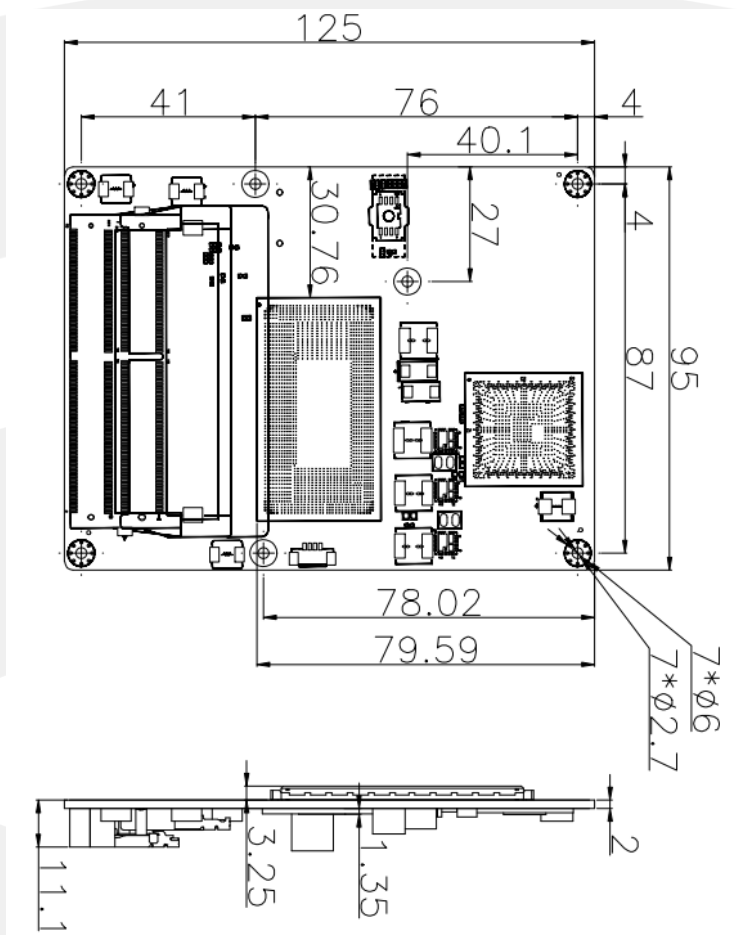
Item	Description	WSA07015B12H
2.1	Rated and operating voltage VDC	12 V(10.8 – 13.2V)
2.2	Rated current A (avg)	0.16(MAX : 0.20A)
2.3	Rated input W	1.92(MAX : 2.40W)
2.4	Rated speed (rpm)	DUTY 100% : 4500 ±10% , DUTY0% : 800 ± 350 RPM
2.5	Start up voltage (VDC)	7.0V ON/OFF
2.6	Air volume M3/Min (CFM)	N/C
2.7	Static pressure Max mmH2O (mmH2O=9.81Pa)	N/C
2.8	Noise DB(100cm)	DUTY 100% : 36.0(MAX: 39.0) DUTY 0% : N/A
2.9	Insulation resistance	At least 10 MΩ at 500VDC between internal stator and both lead wires.
2.10	Dielectric strength	Applied a 500VAC for 1.0 minute or 600VAC for 2 seconds between housing and both lead wires.

3.1	Fan size	: 70 x 70 x 15 mm
3.2	Fan Weight	: Total around 32.5±5 g
3.3	Blade ass'y Weight	: Around 16.0g±3 g
3.3	Bearing type	: F.D. Bearing /One ball /Sleeve bearing/ Two ball
3.4	Lead wire	: UL 1571 AWG28, Rated 300V, 80°C
3.5	Frame	: P B T. UL94V-0
3.6	Impeller	: P B T. UL94V-0
3.7	P C B.	: UL94V-0
3.8	Free drop shock	: Free drop to a thick wooden board from 60 cm height in the smallest packing unit by dropping on X,Y and Z faces with no power supply.
3.9	MATERIAL LIST	THIS IS PRODUCT RoHs COMPLIANT

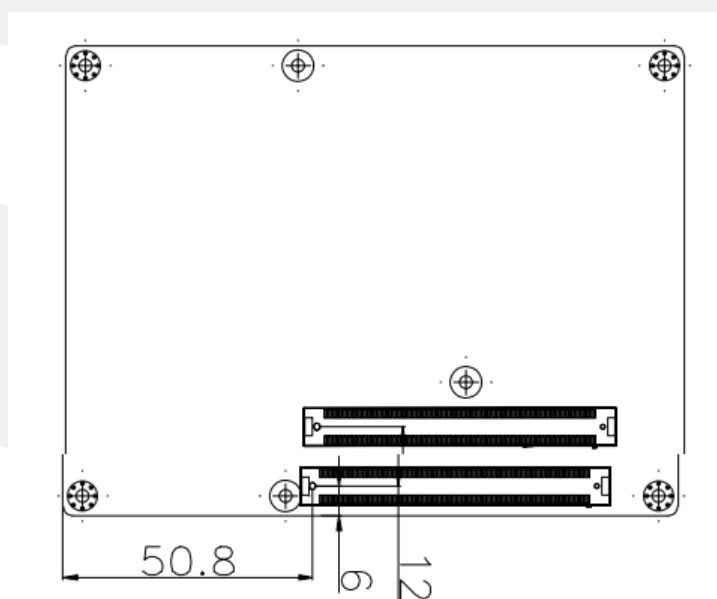
第二章 安装说明

2.1 接口/尺寸图

安装设备时, 请对照此示意图并仔细阅读下面的说明, 安装组件过程中必须小心, 对于有些部件, 如果安装不正确, 设备将不能正常工作。



TOP Side



Bottom Side

2.2 硬件安装

⚠ 注意：操作时，请戴上防静电手套，因为静电有可能会损坏部件。

本主板关键元器件都是集成电路，而这些元件很容易因为遭受静电的影响而损坏。因此，请在正式安装主板之前，请先做好以下的准备：

1. 拿主板时手握板边，尽可能不触及元器件和插头插座的引脚。
2. 接触集成路元件（如 CPU、RAM 等）时，最好戴上防静电手环/手套。
3. 在集成电路元件未安装前，需将元件放在防静电垫或防静电袋内。
4. 在确认电源的开关处于断开位置后，再插上电源插头。

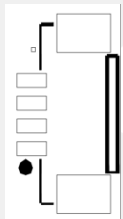
2.3 跳线功能设置

在进行硬件设备安装之前，请按照您的需要对相应的跳线进行设置。

提示：如何识别跳线、接口的第 1 针脚，观察插头插座旁边的文字标记，会用“1”或加粗的线条或三角符号表示；看看背面的焊盘，方型焊盘为第 1 针脚；所有跳线的针脚 1 旁都有 1 个白色箭头。

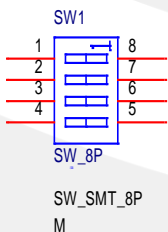
2.4 接口引脚定义

2.4.1 CPU_FAN1 引脚定义



管脚	电平设定
1	GND
2	5V
3	FAN_TAC
4	FAN_CTL

2.4.2 SW1 引脚设定 (IT8659 Power-On Strapping)



管脚	电平设定
1	拨码到 1VCC)
2	拨码到 2(GND)
3	拨码到 3(VCC)
4	拨码到 4(GND)

2.4.3 COMe 220PIN 引脚定义

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	GND	B1	GND	C1	GND	D1	GND
A2	MDI3-_LAN2	B2	ACTIVITY_N2	C2	GND	D2	GND
A3	MDI3+_LAN2	B3	LPC_FRAME_N	C3	USB31_P1_RX N	D3	USB31_P1_C_T XN
A4	LINK100_N2	B4	LPC_AD0	C4	USB31_P1_RX P	D4	USB31_P1_C_T XP
A5	LINK1000_N2	B5	LPC_AD1	C5	GND	D5	GND
A6	MDI2-_LAN2	B6	LPC_AD2	C6	USB32_P2_RX N	D6	USB32_P2_TX N
A7	MDI2+_LAN2	B7	LPC_AD3	C7	USB32_P2_RX P	D7	USB32_P2_TXP
A8	NC	B8	NC	C8	GND	D8	GND
A9	MDI1-_LAN2	B9	NC	C9	NC	D9	NC
A10	MDI1+_LAN2	B10	LPC_CLK	C10	NC	D10	NC
A11	GND	B11	GND	C11	GND	D11	GND
A12	MDI0-_LAN2	B12	PANSWH#	C12	NC	D12	NC
A13	MDI0+_LAN2	B13	SMB_CLK	C13	NC	D13	NC
A14	NC	B14	SMB_DATA	C14	GND	D14	GND
A15	SLP_S3_N	B15	SMBALERT	C15	NC	D15	DDPB_CTRLCL K_AUX+
A16	SATA0_TXP	B16	SATA1_TXP	C16	NC	D16	DDPB_CTRLDA TA_AUX-
A17	SATA0_TXN	B17	SATA1_TXN	C17	NC	D17	NC
A18	SLP_S4_N	B18	NC	C18	NC	D18	NC
A19	SATA0_RXP	B19	SATA1_RXP	C19	PEG4_RXP7	D19	PEG4_TXP7
A20	SATA0_RXN	B20	SATA1_RXN	C20	PEG4_RXN7	D20	PEG4_TXN7
A21	GND	B21	GND	C21	GND	D21	GND
A22	SATA2_TXP	B22	SATA3_TXP	C22	PEG4_RXP8	D22	PEG4_TXP8
A23	SATA2_TXN	B23	SATA3_TXN	C23	PEG4_RXN8	D23	PEG4_TXN8
A24	SLP_S5_N	B24	ATXPG	C24	DDP1_HPD	D24	NC
A25	SATA2_RXP	B25	SATA3_RXP	C25	NC	D25	NC
A26	SATA2_RXN	B26	SATA3_RXN	C26	NC	D26	DDI1_TXP0
A27	NC	B27	WDTO_N	C27	NC	D27	DDI1_TXN0
A28	SATA_LED	B28	NC	C28	GND	D28	NC
A29	HDA_SYNC	B29	NC	C29	NC	D29	DDI1_TXP1
A30	HDA_RST-	B30	HDA_SDIN0	C30	NC	D30	DDI1_TXN1
A31	GND	B31	GND	C31	GND	D31	GND
A32	HDA_BIT_CLK	B32	SPK-	C32	DDPC_CTRLCL K_AUX+	D32	DDI1_TXP2

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A33	HDA_SDOUT	B33	I2C1_SCL	C33	DDPC_CTRLD ATA_AUX-	D33	DDI1_TXN2
A34	NC	B34	I2C1_SDA	C34	DDPC_DDC_A UX_SEL	D34	DDPB_DDC_AU X_SEL
A35	THRMTRIP	B35	CME_THRM	C35	NC	D35	NC
A36	USB2_N7	B36	USB2_N8	C36	DDI3_AUXP	D36	DDI1_TXP3
A37	USB2_P7	B37	USB2_P8	C37	DDI3_AUXN	D37	DDI1_TXN3
A38	NC	B38	NC	C38	NC	D38	NC
A39	USB2_N5	B39	USB2_N6	C39	DDI3_TXP0	D39	DDI2_TXP0
A40	USB2_P5	B40	USB2_P6	C40	DDI3_TXN0	D40	DDI2_TXN0
A41	GND	B41	GND	C41	GND	D41	GND
A42	USB2_N3	B42	USB2_N4	C42	DDI3_TXP1	D42	DDI2_TXP1
A43	USB2_P3	B43	USB2_P4	C43	DDI3_TXN1	D43	DDI2_TXN1
A44	NC	B44	USB_OC0_N	C44	DDI3_HPD	D44	DDI2_HPD
A45	USB2_N1	B45	USB2_N2	C45	NC	D45	NC
A46	USB2_P1	B46	USB2_P2	C46	DDI3_TXP2	D46	DDI2_TXP2
A47	VCC_RTC	B47	PLTRST_N2	C47	DDI3_TXN2	D47	DDI2_TXN2
A48	PLTRST_N2	B48	EXCD1_CPPE_ N	C48	NC	D48	NC
A49	EXCD0_CPPE_ N	B49	RST_N	C49	DDI3_TXP3	D49	DDI2_TXP3
A50	SERIRQ	B50	PLTRST_N2	C50	DDI3_TXN3	D50	DDI2_TXN3
A51	GND	B51	GND	C51	GND	D51	GND
A52	PEG4_TXP6	B52	PEG4_RXP6	C52	PEG4_RXP0	D52	PEG4_TXP0
A53	PEG4_TXN6	B53	PEG4_RXN6	C53	PEG4_RXN0	D53	PEG4_TXN0
A54	GP_D17	B54	GP_D6	C54	GND	D54	NC
A55	PEG4_TXP5	B55	PEG4_RXP5	C55	PEG4_RXP1	D55	PEG4_TXP1
A56	PEG4_TXN5	B56	PEG4_RXN5	C56	PEG4_RXN1	D56	PEG4_TXN1
A57	GND	B57	GP_D5	C57	NC	D57	NC
A58	PEG4_TXP4	B58	PEG4_RXP4	C58	PEG4_RXP2	D58	PEG4_TXP2
A59	PEG4_TXN4	B59	PEG4_RXN4	C59	PEG4_RXN2	D59	PEG4_TXN2
A60	GND	B60	GND	C60	GND	D60	GND
A61	PEG4_TXP3	B61	PEG4_RXP3	C61	PEG4_RXP3	D61	PEG4_TXP3
A62	PEG4_TXN3	B62	PEG4_RXN3	C62	PEG4_RXN3	D62	PEG4_TXN3
A63	GP_D18	B63	GP_D8	C63	NC	D63	NC
A64	PEG4_TXP2	B64	PEG4_RXP2	C64	NC	D64	SIO_RSMRST#
A65	PEG4_TXN2	B65	PEG4_RXN2	C65	PEG4_RXP4	D65	PEG4_TXP4
A66	GND	B66	WAKE_N	C66	PEG4_RXN4	D66	PEG4_TXN4
A67	GP_D19	B67	NC	C67	NC	D67	GND
A68	PEG4_TXP1	B68	PEG4_RXP1	C68	PEG4_RXP5	D68	PEG4_TXP5
A69	PEG4_TXN1	B69	PEG4_RXN1	C69	PEG4_RXN5	D69	PEG4_TXN5

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A70	GND	B70	GND	C70	GND	D70	GND
A71	LVDS_TX_L2P	B71	LVDS_TX_U0P	C71	PEG4_RXP6	D71	PEG4_TXP6
A72	LVDS_TX_L2N	B72	LVDS_TX_U0N	C72	PEG4_RXN6	D72	PEG4_TXN6
A73	LVDS_TX_L1P	B73	LVDS_TX_U1P	C73	GND	D73	GND
A74	LVDS_TX_L1N	B74	LVDS_TX_U1N	C74	PEG4_RXP7	D74	PEG4_TXP7
A75	LVDS_TX_L0P	B75	LVDS_TX_U2P	C75	PEG4_RXN7	D75	PEG4_TXN7
A76	LVDS_TX_L0N	B76	LVDS_TX_U2N	C76	GND	D76	GND
A77	EDP_VDDEN_R	B77	LVDS_TX_U3P	C77	NC	D77	ATX_PSON_N
A78	LVDS_TX_L3P	B78	LVDS_TX_U3N	C78	PEG4_RXP8	D78	PEG4_TXP8
A79	LVDS_TX_L3N	B79	EDP_BKEN_R	C79	PEG4_RXN8	D79	PEG4_TXN8
A80	GND	B80	GND	C80	GND	D80	GND
A81	LVDS_TX_CLKL_P	B81	LVDS_TX_CLK_UP	C81	PEG4_RXP9	D81	PEG4_TXP9
A82	LVDS_TX_CLKL_N	B82	LVDS_TX_CLK_UN	C82	PEG4_RXN9	D82	PEG4_TXN9
A83	EDP_AUX_C_P	B83	EDP_BKCTL_R	C83	NC	D83	SIO_PWROK
A84	EDP_AUX_C_N	B84	5VSB_ATX	C84	GND	D84	GND
A85	GP_D20	B85	5VSB_ATX	C85	PEG4_RXP10	D85	PEG4_TXP10
A86	NC	B86	5VSB_ATX	C86	PEG4_RXN10	D86	PEG4_TXN10
A87	EDP_HPD	B87	5VSB_ATX	C87	GND	D87	GND
A88	CLK_SRC2_DP	B88	NC	C88	PEG4_RXP11	D88	PEG4_TXP11
A89	CLK_SRC2_DN	B89	MONRED	C89	PEG4_RXN11	D89	PEG4_TXN11
A90	GND	B90	GND	C90	GND	D90	GND
A91	V1P8A	B91	MONGREEN	C91	PEG4_RXP12	D91	PEG4_TXP12
A92	SPIO_MISO_IO_1	B92	MONBLUE	C92	PEG4_RXN12	D92	PEG4_TXN12
A93	GP_D5	B93	MONHSYNC	C93	GND	D93	GND
A94	SPIO_CLK	B94	MONVSYNC	C94	PEG4_RXP13	D94	PEG4_TXP13
A95	SPIO_MOSI_IO_0	B95	VGA_SCL	C95	PEG4_RXN13	D95	PEG4_TXN13
A96	TPM_PP	B96	VGA_SDA	C96	GND	D96	GND
A97	NC	B97	SPIO_CS0_N	C97	NC	D97	NC
A98	SOUT3	B98	NC	C98	PEG4_RXP14	D98	PEG4_TXP14
A99	SIN3	B99	NC	C99	PEG4_RXN14	D99	PEG4_TXN14
A100	GND	B100	GND	C100	GND	D100	GND
A101	SOUT4	B101	SYSFANOUT	C101	PEG4_RXP15	D101	PEG4_TXP15
A102	SIN4	B102	SYSFANIN	C102	PEG4_RXN15	D102	PEG4_TXN15
A103	PCH_GPIO4	B103	CME_SLEEP_N	C103	GND	D103	GND
A104	DC12	B104	DC12	C104	DC12	D104	DC12
A105	DC12	B105	DC12	C105	DC12	D105	DC12
A106	DC12	B106	DC12	C106	DC12	D106	DC12

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A107	DC12	B107	DC12	C107	DC12	D107	DC12
A108	DC12	B108	DC12	C108	DC12	D108	DC12
A109	DC12	B109	DC12	C109	DC12	D109	DC12
A110	GND	B110	GND	C110	GND	D110	GND

第三章 BIOS 程序设置

AMI BIOS 刷新

BIOS 提供对硬件资源的底层驱动，是联系硬件和操作系统的桥梁。现在硬件和各种应用软件不断更新，当您的系统遇到问题时，例如系统不支持最新公布的 CPU 时，就需要升级您的 BIOS 了。

注意：

1. 升级 BIOS 只在遇到问题，必要的时候进行。
2. 升级 BIOS 请使用我们驱动光盘内所附的 BIOS 读写程序，或者在相关网站下载更新版本的程序。
3. 在升级过程中不要关闭电源或重新启动系统，以免造成您的 BIOS 资料将被损坏，系统也可能不能启动。
4. 为防止意外发生，请您先备份当前的 BIOS 资料。

AMI BIOS 描述

开机时，BIOS 会对主板上的硬件进行自我诊断，设定硬件时序参数等工作，最后才将系统控制权交给操作系统。如何正确的设定 BIOS 参数对系统是否稳定的工作及系统是否工作在最佳状态至关重要。

进入 BIOS 参数设置

电脑开机，在完成自我诊断后，屏幕上会显示出如下信息：Del->SETUP，此时您点击一下 Del 键，则 BIOS 在完成 IDE 等设备的侦测后会自动转入 SETUP 设置画面。

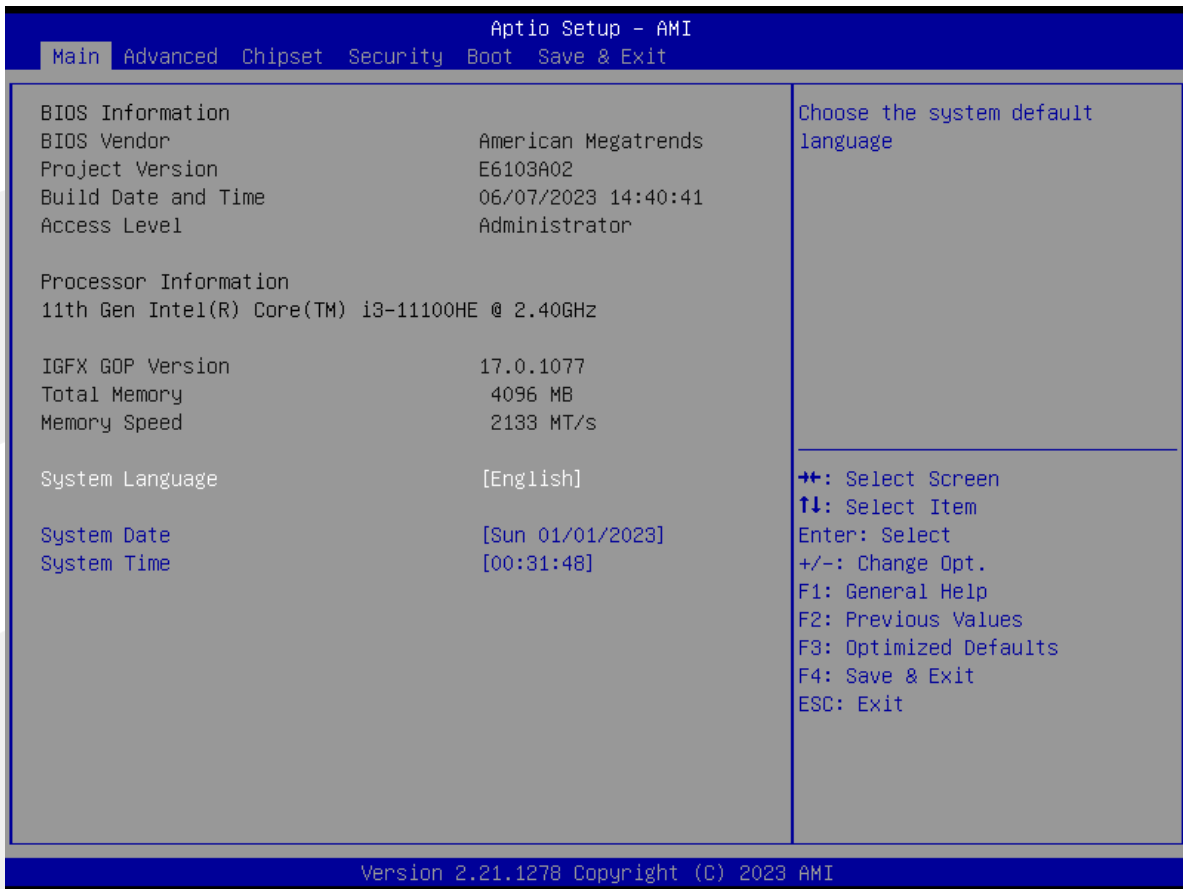
1. 打开系统电源或重新启动系统，显示器屏幕将出现自我测试的信息。
2. 当屏幕中间出现“Pressto enter setup”提示时，按下键，就可以进入 BIOS 设定程序。
3. 以方向键移动至您要修改的选项，按下<Enter>键即可进入该选项的子画面。
4. 使用方向键及<Enter>键即可修改所选项目的值，按回车键选择 BIOS 选项并修改。
5. 任何时候按下<Esc>键即可回到上一画面。



提示：BIOS 参数属于系统关键信息，请勿随意设置，如需设置或者升级请联系我司售后支持，谢谢！

3.1 Main Screen

The Main screen is the first screen that is displayed when the BIOS Setup is entered.

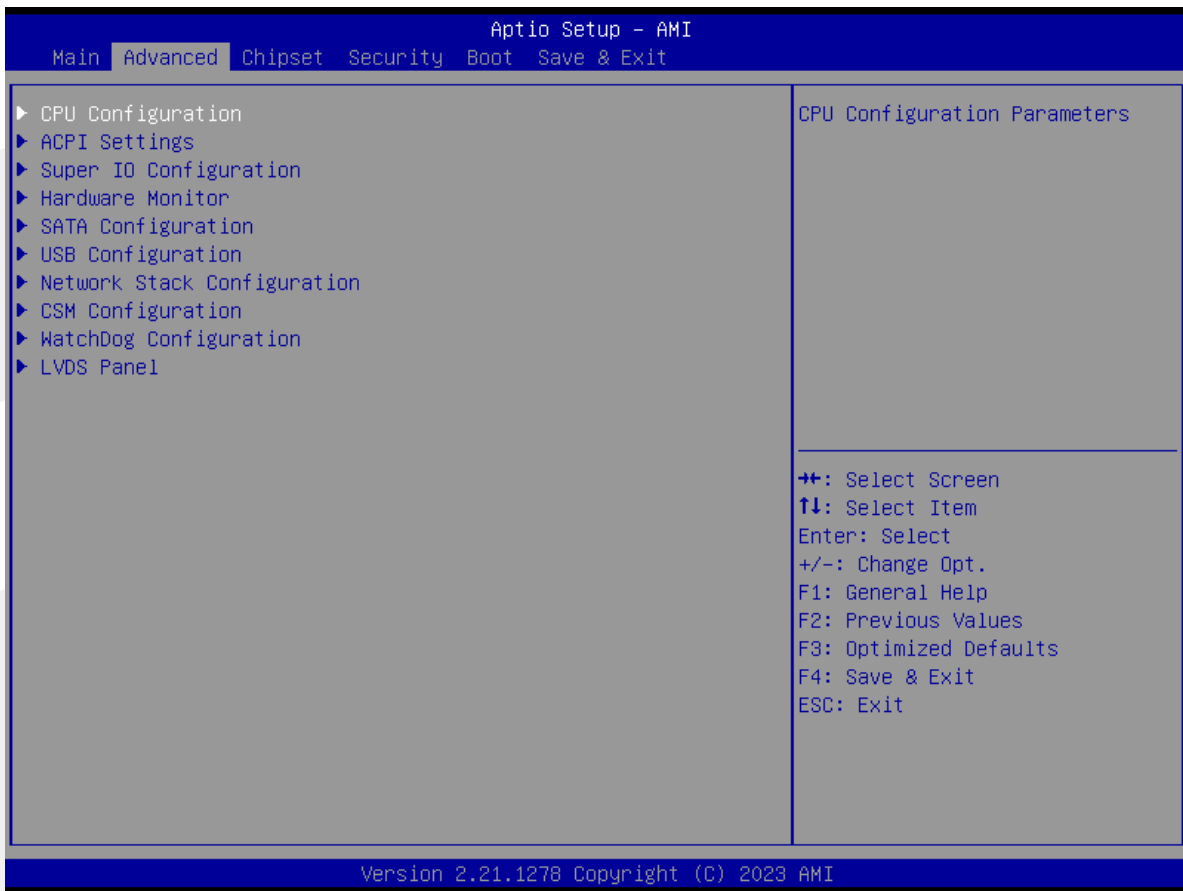


Setup Item	Options	Help Text	Comments
BIOS Information			
BIOS Vendor			Displays BIOS vendor.
Project Version			Displays the current BIOS version: Format: AAAABBC AAAAA = Project name BB = BIOS revision C = Customer number
Build Date and Time			Displays the current BIOS build date.
Access Level			Displays password level that setup is running in: Administrator or User. With no passwords set, Administrator is the default mode.

Setup Item	Options	Help Text	Comments
Processor Information			
CPU XXXXX			Displays the CPU Brand String installed in the system.
Total Memory			Displays the total physical memory installed in the system, MB Unit.
Memory Speed			
System Language	English	Choose the system default language.	
System Date	[Day of week MM/DD/YYYY]	Set and display the Date.	
System Time	[HH:MM:SS]	Set and display the Time.	

3.2 Advanced Screen

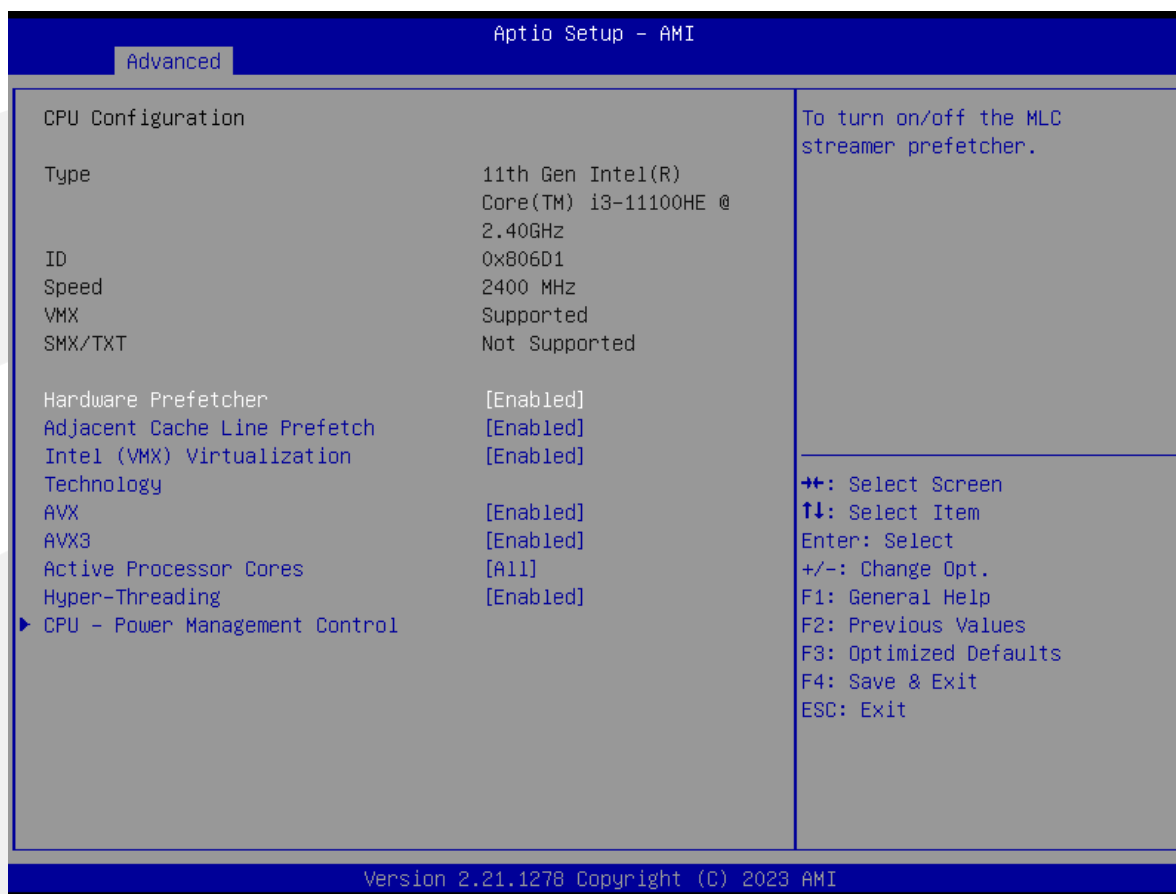
The Advanced screen provides an access point to configure several options. On this screen, the user selects the option that is to be configured.



Setup Item	Options	Help Text	Comments
CPU Configuration		CPU Configuration Parameters.	
ACPI Settings		System ACPI Parameters.	
Super IO Configuration		System Super IO chip Parameters.	
Hardware Monitor		Monitor hardware states.	
SATA Configuration		SATA Devices Configuration.	
USB Configuration		USB Configuration Parameters.	
Network Stack configuration		Enable/Disable UEFI Network Stack.	
CSM Configuration		CSM configuration: Enable/Disable, Option ROM execution settings, etc.	
Watchdog configuration		Set System Watchdog Parameters.	
LVDS Panel		LVDS Panel Settings.	

3.2.1 CPU Configuration Screen

The CPU Configuration screen allows the user to view the processor information, and to enable or disable processor options. To access this screen from the Main screen, choose **Advanced > CPU Configuration**.



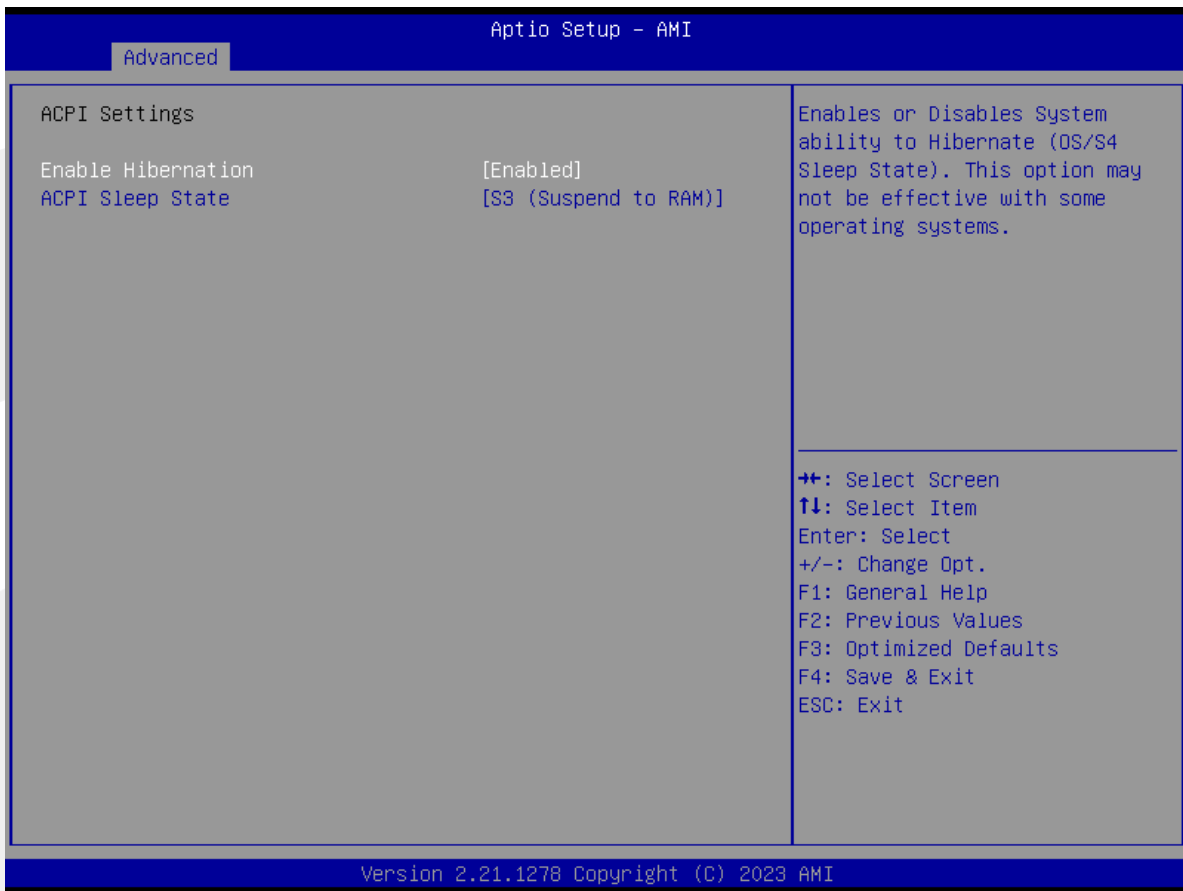
Aptio Setup - AMI		
Advanced		
CPU - Power Management Control		Select the performance state that the BIOS will set starting from reset vector.
Boot performance mode	[Max Non-Turbo]	
Intel(R) SpeedStep(tm)	[Enabled]	
Turbo Mode	[Enabled]	
▶ Config TDP Configurations		
C states	[Disabled]	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Aptio Setup - AMI		
Advanced		
Config TDP Configurations		Applies TDP initialization settings based on non-cTDP or cTDP. Default is 1: Applies to cTDP; if 0 then applies non-cTDP and BIOS will bypass cTDP initialization flow
Enable Configurable TDP	[Applies to cTDP]	
Configurable TDP Boot Mode	[Nominal]	
Configurable TDP Lock	[Disabled]	
CTDP BIOS control	[Disabled]	
ConfigTDP Levels	2	
ConfigTDP Turbo Activation Ratio	23 (Unlocked)	
Power Limit 1	45.0W (MSR:45.0)	
Power Limit 2	55.0W (MSR:55.0)	
Custom Settings Nominal		
ConfigTDP Nominal	Ratio:24 TAR:23 PL1:13.0W	
Power Limit 1	0	
Power Limit 2	0	
Power Limit 1 Time Window	[0]	
ConfigTDP Turbo Activation Ratio	0	
Custom Settings Down		
ConfigTDP Level1	Ratio:19 TAR:18 PL1:3.0W	
Power Limit 1	0	
Power Limit 2	0	
Power Limit 1 Time Window	[0]	
ConfigTDP Turbo Activation Ratio	0	
Version 2.21.1278 Copyright (C) 2023 AMI		

Setup Item	Options	Help Text	Comments
CPU Configuration			
Type			
ID			
Speed			
VMX			
SMX/TXT			
Hardware Prefetcher	Enabled Disabled	To turn on/off the MLC streamer prefetcher.	
Adjacent Cache line Prefetch	Enabled Disabled	To turn on/off prefetching of adjacent cache lines.	
Intel(VMX) Technology	Enabled Disabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool technology.	
AVX	Enabled		
AVX3	Enabled		
Active Processor Cores	All 1 2 3	Number of cores to enable in each processor package.	
Hyper-Threading	Enabled		
CPU Power Management Control			
Boot performance mode	Max Non-Turbo Max battery Turbo Performance	Select the performance state that the BIOS will set starting from reset vector.	
Intel® SpeedStep™	Enabled Disabled	Allows more than two frequency ranges to be supported.	
Turbo Mode	Enabled		
C states	Disabled		
Config TDP configurations			
Enable Configurable TDP	Applies to cTDP		
Configurable TDP Boot Mode	Nominal		
Configurable TDP Lock	Disabled		
CTDP BIOS control	Disabled		
ConfigTDP Nominal			
Power Limit1	0		
Power Limit2	0		

3.2.2 ACPI Settings Screen

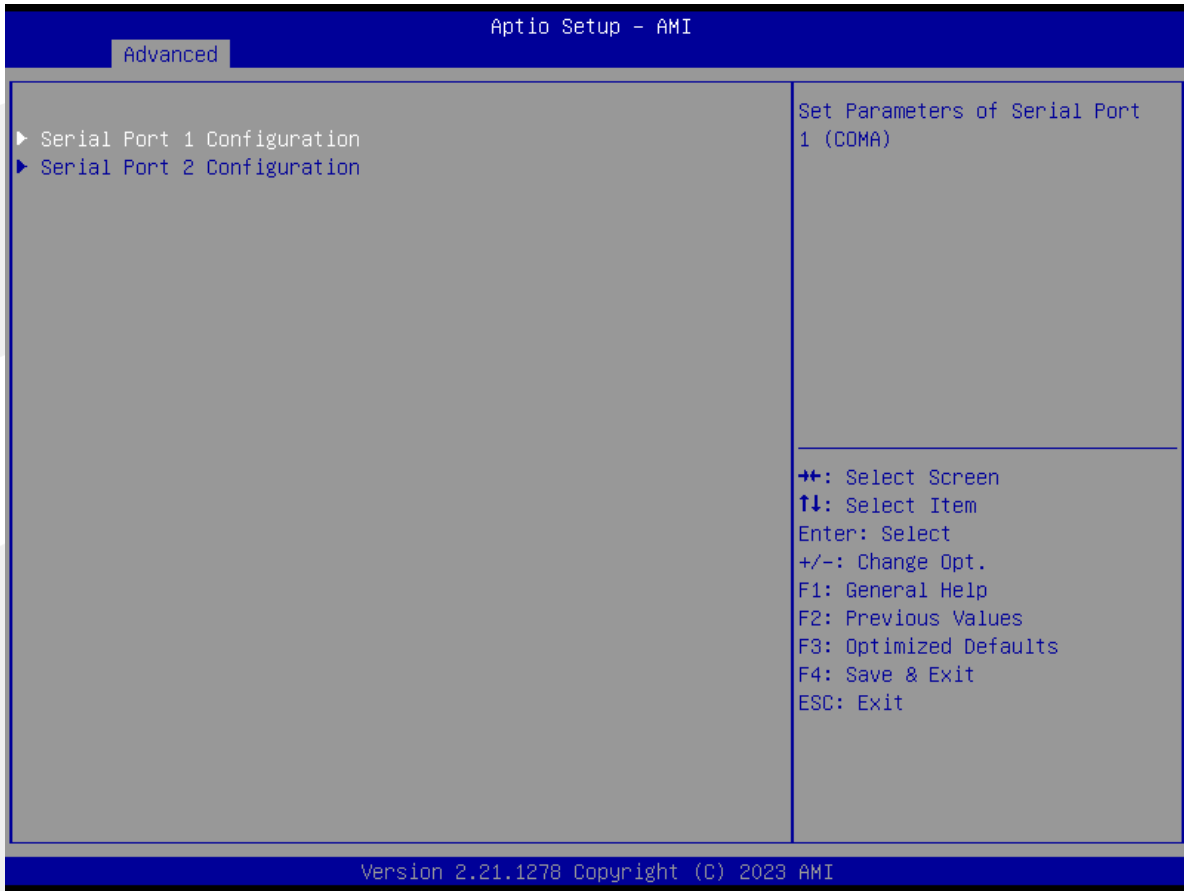
The ACPI Settings screen allows the user to set the system ACPI parameters. To access this screen from the Main screen, choose **Advanced > ACPI Settings**.



Setup Item	Options	Help Text	Comments
ACPI Settings			
Enable Hibernation	Enabled		
ACPI Sleep State	Suspend Disabled S3 (Suspend to RAM)	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	Sleep supported optionally.

3.2.3 Super IO Configuration

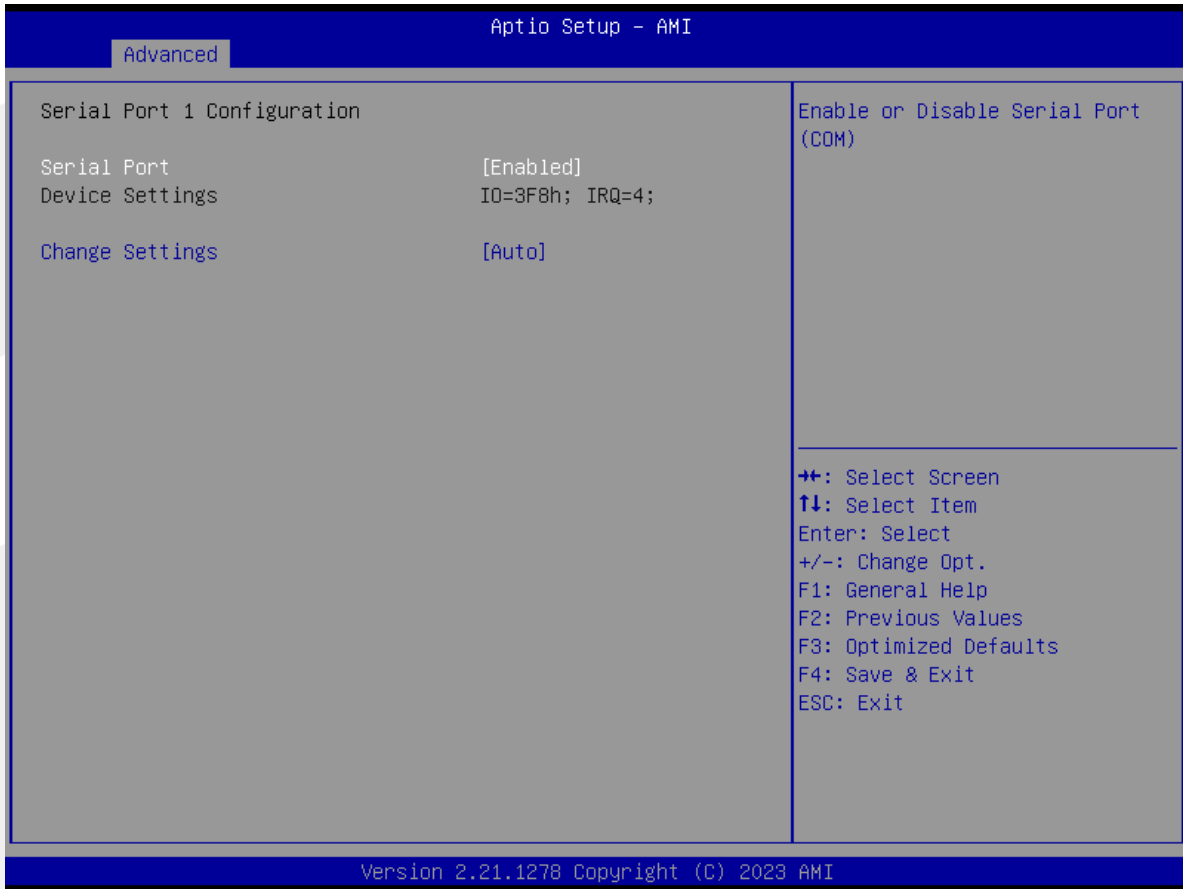
The Super IO Configuration screen allows the user to view the super IO information, and to enable or disable super IO options. To access this screen from the Advanced screen, choose **Advanced > Super IO Configuration**.



Setup Item	Options	Help Text	Comments
Super IO Configuration			
Serial Port 1 Configuration			Set Parameters of Serial Port 1 (COM1).
Serial Port 2 Configuration			Set Parameters of Serial Port 2 (COM2).

3.2.3.1 Serial PortX Configuration

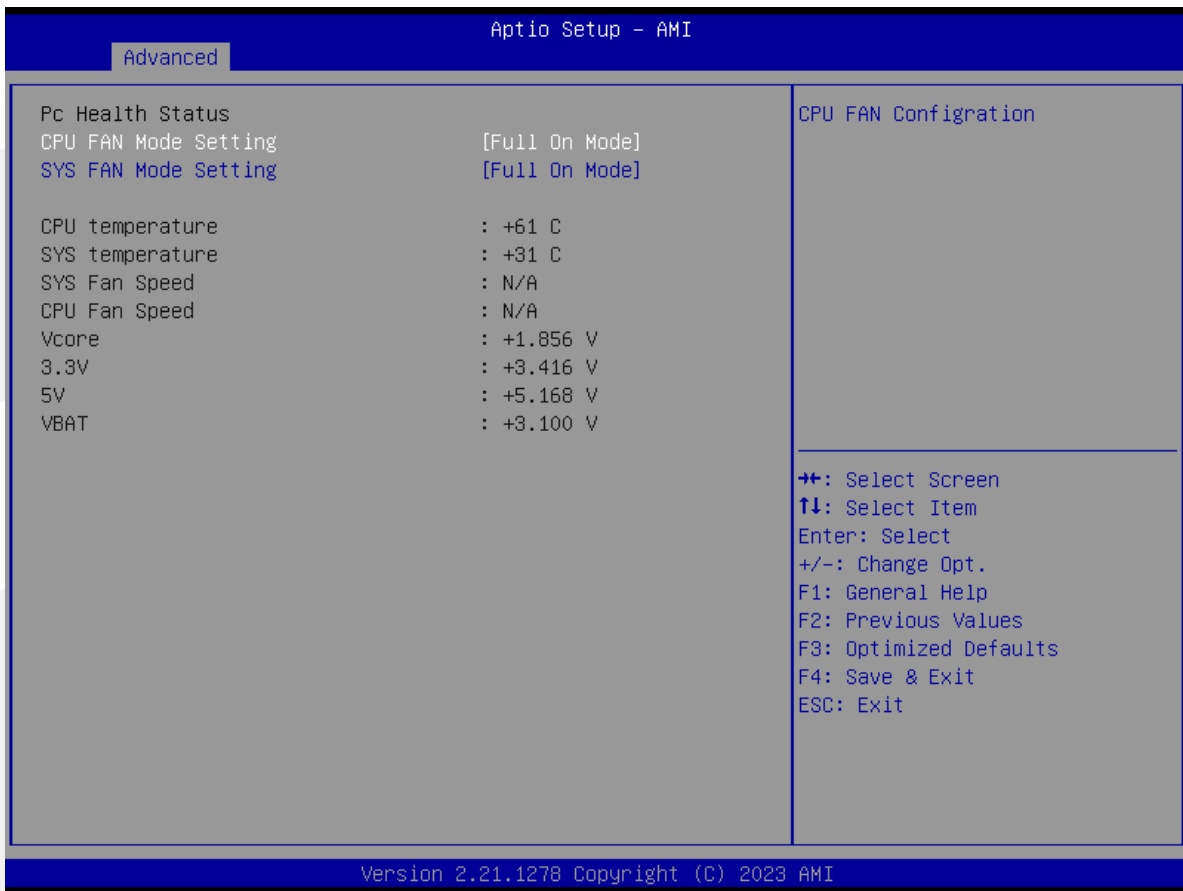
The Super IO Configuration screen allows the user to view the super IO information, and to enable or disable serial port options. To access this screen from the Advanced screen, choose **Advanced-> Super IO Configuration->Serial PortX Configuration**.



Setup Item	Options	Help Text	Comments
Serial PortX Configuration			
Serial Port	Enabled Disabled	Enable or Disable Serial Port (COM).	
Change Settings	Auto IO=3F8h; IRQ=4 IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12	Select an optimal settings for Super IO Device.	

3.2.4 Hardware Monitor

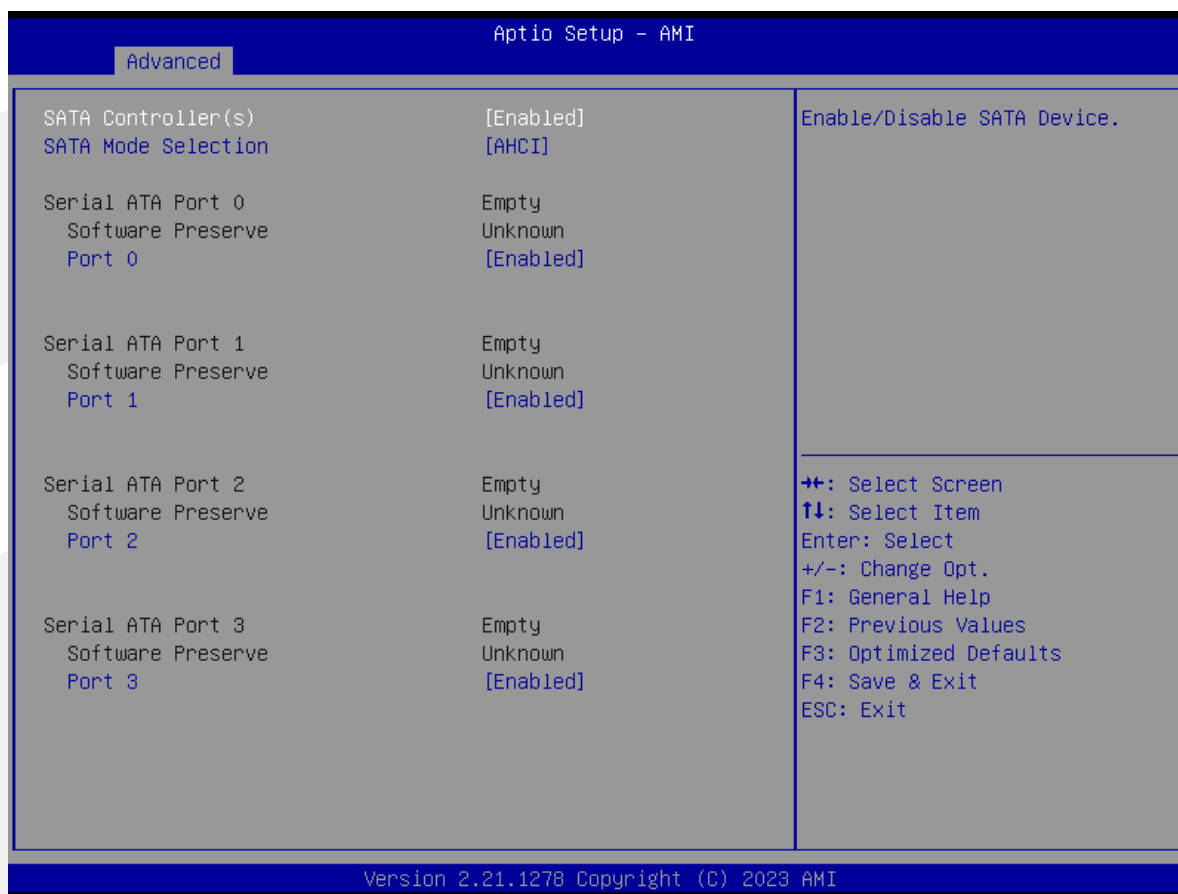
The hardware monitor screen allows the user to view the hardware information. To access this screen from the Advanced screen, choose **Advanced-> Hardware Monitor**.



Setup Item	Options	Help Text	Comments
PC Health Status			
CPU FAN Mode Setting	Full On mode Automatic mode Manual mode	Fan control mode select.	When Manual mode selected, Manual PWM Setting shows to set FAN PWM Duty.
SYS FAN Mode Setting	Full On mode Automatic mode Manual mode	Fan control mode select.	When Manual mode selected, Manual PWM Setting shows to set FAN PWM Duty.
Manual PWM	255		
CPU temperature		Shows Current CPU temperature.	NOTE1: Sometimes not the actual temperature value, just indicates temperature tolerance limitation.
Fan2 Speed			HW Information.

3.2.5 SATA Configuration

The SATA Configuration screen allows the user to view the SATA Controller information, and to enable or disable SATA Controller options. To access this screen from the Main screen, choose **Advanced > SATA Configuration**.

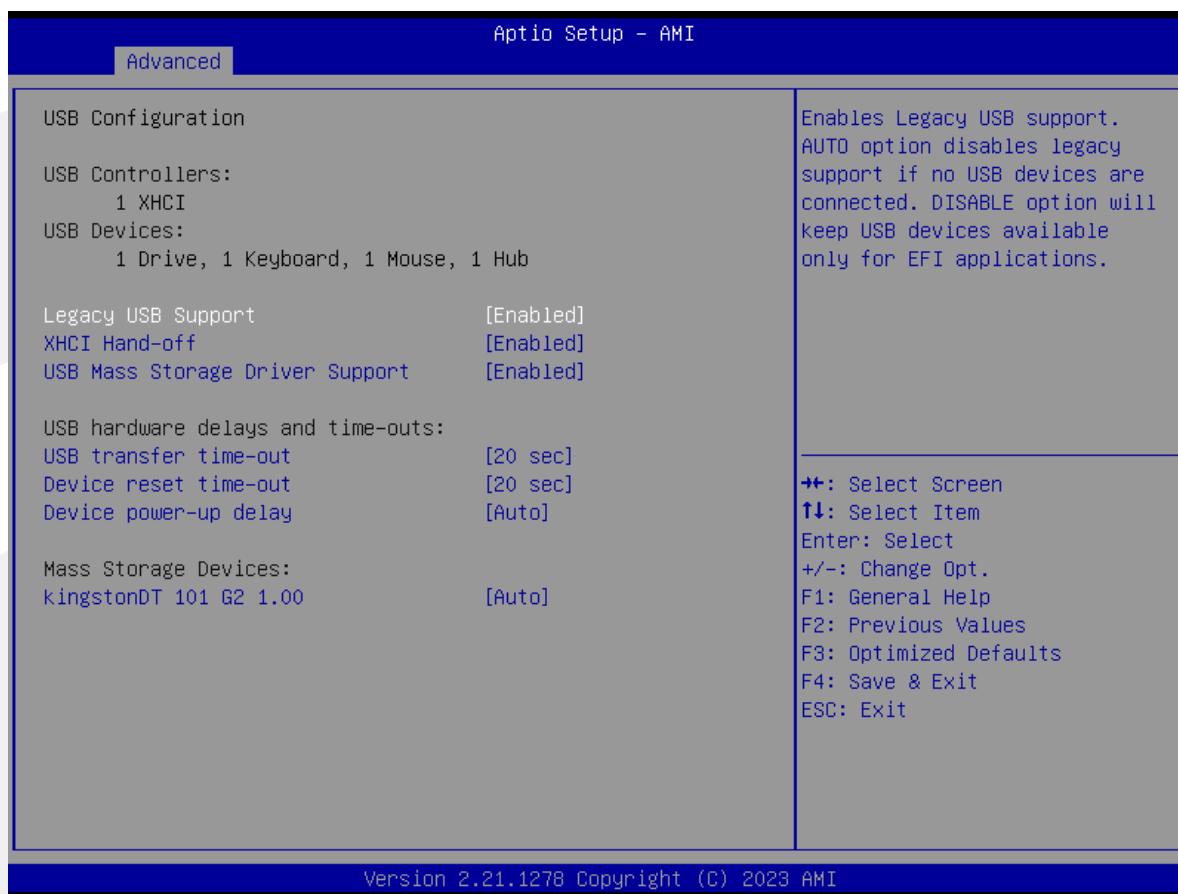


Setup Item	Options	Help Text	Comments
SATA Configuration			
SATA Configuration			
SATA Controller(s)	Enabled Disabled	Enable / Disable SATA Device.	
SATA Mode Selection	AHCI Mode	Select AHCI.	
Serial ATA Port 0			Show HDD information connected.
Serial ATA Port 1			
Serial ATA Port 2			
Serial ATA Port 3			

Note: If SATA or PCIe RAID groups are configured separately, contact technical support.

3.2.6 USB Configuration

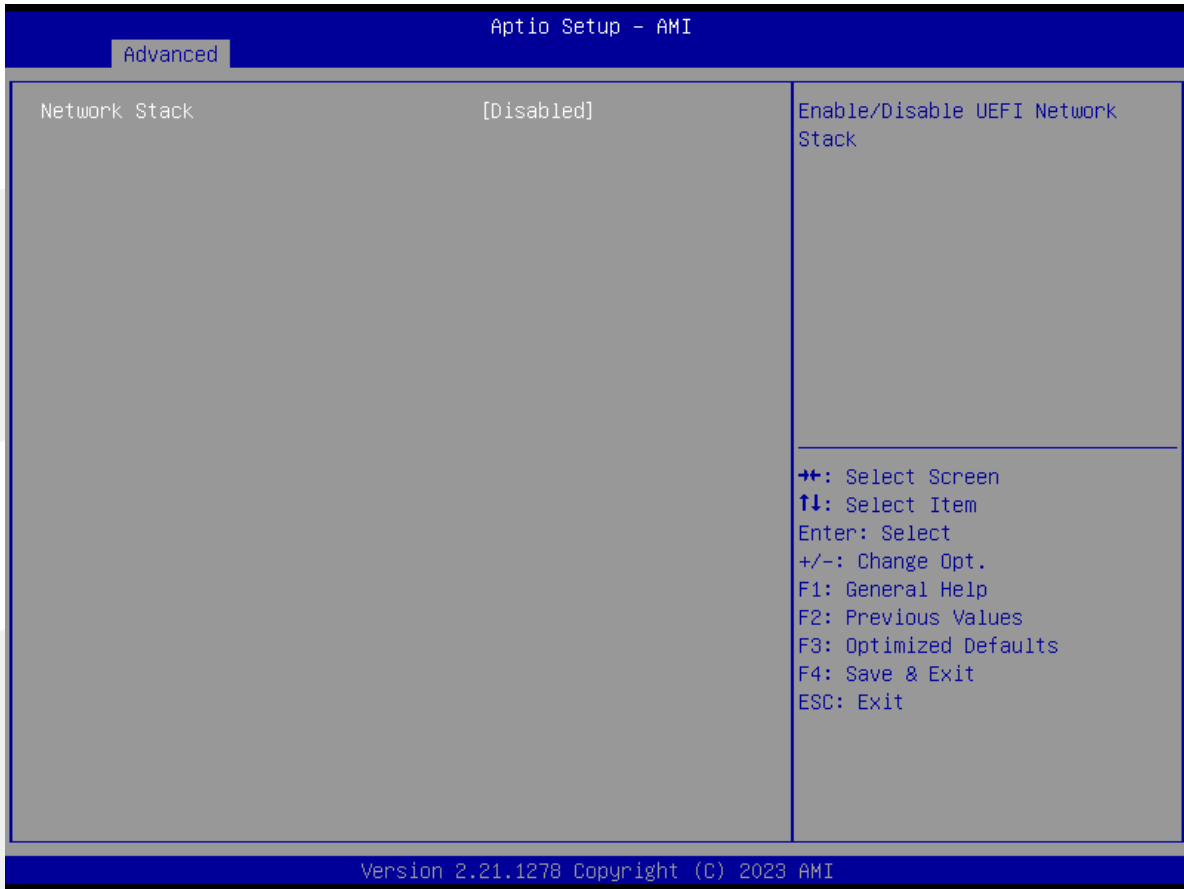
The USB Configuration screen allows the user to view the USB Configuration information, and to enable or disable options. To access this screen from the Main screen, choose **Advanced > USB Configuration**.



Setup Item	Options	Help Text	Comments
USB Configuration			
Legacy USB Support	Enabled Disabled	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.	
XHCI Hand-off	Enabled Disabled	This is a workaround for Oses without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.	
USB MASS Storage Driver Support	Enabled Disabled	Enable/Disable USB Mass Storage Driver Support.	
USB hardware delays and time-outs			
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers.	
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out.	
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. ' auto' uses default value: for a Root port it is 100ms,for a Hub port the delay is taken from Hub descriptor.	
Mass Storage Device			
kingstonDT 101 G2 1.00	Auto		

3.2.7 Network Stack Configuration

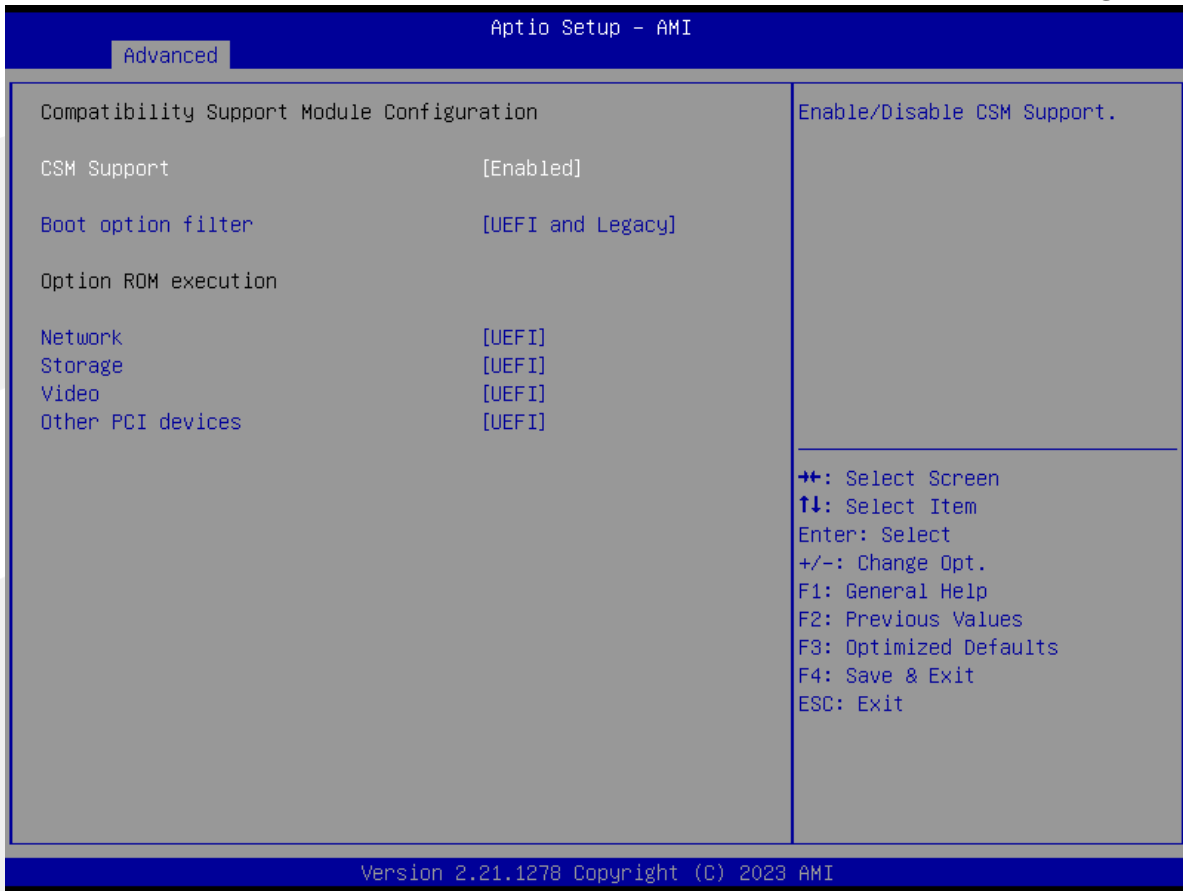
To access this screen from the Main screen, choose **Advanced > Network Stack Configuration**.



Setup Item	Options	Help Text	Comments
Network Stack Configuration			
Network Stack	Disabled Enabled		Enable/Disable UEFI Network Stack.
IPv4 PXE Support	Disabled Enabled		Enable/Disable IPv4 PXE boot support.
IPv4 HTTP Support	Disabled Enabled		Enable/Disable IPv4 HTTP boot support.
IPv6 PXE Support	Disabled Enabled		Enable/Disable IPv6 PXE boot support.
IPv6 HTTP Support	Disabled Enabled		Enable/Disable IPv6 HTTP boot support.

3.2.8 CSM Configuration

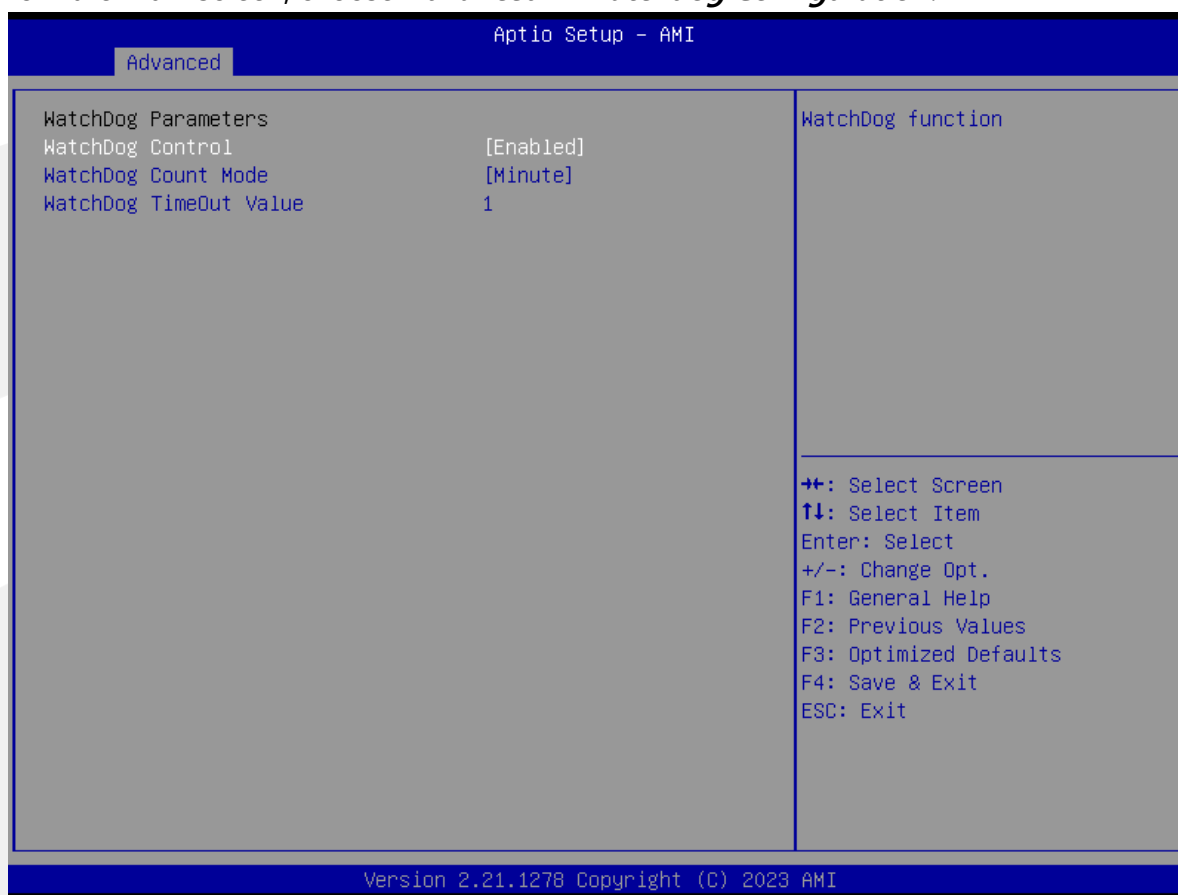
The CSM Configuration screen allows the user to view the CSM information, and to enable or disable CSM options. To access this screen from the Main screen, choose **Advanced > CSM Configuration**.



Setup Item	Options	Help Text	Comments
CSM Configuration			
CSM Support	Enabled Disabled	Enable / Disable CSM support.	
Boot option filter	UEFI and Legacy Legacy only UEFI only	This option control Legacy/UEFI ROMs priority.	
Network	Legacy UEFI Do not lunch	Control the execution of UEFI and Legacy PXE OpROM.	
Storage	Legacy UEFI Do not lunch	Control the execution of UEFI and Legacy Storage OpROM.	
Video	Legacy UEFI Do not lunch	Control the execution of UEFI and Legacy video OpROM.	
Other PCI devices	Legacy UEFI Do not lunch	Determines OpROM execution policy for devices other than Network,Storage or video.	

3.2.9 Watchdog Configuration

The Watchdog Configuration screen allows the user to Set System WatchDog Parameters. To access this screen from the Main screen, choose **Advanced > Watchdog Configuration**.



Setup Item	Options	Help Text	Comments
Watchdog Configuration			
WatchDog Control	Disabled Enabled		WatchDog function.
WatchDog Count Mode	Minute Second		WatchDog Count Mode Selection.
WatchDog TimeOut Value	1		Fill WatchDog TimeOut (0~255),0 means function disabled.

3.2.10 LVDS Panel

To access this screen from the Main screen, choose **Advanced > LVDS Panel**.



Setup Item	Options	Help Text	Comments
LVDS Panel			
LVDS Control	Disabled Enabled		Enable or Disable for LVDS control.
LVDS Panel	1024*768/24/Single		

3.3 Chipset Screen

The Chipset screen provides an access point to configure SA Configuration and PCH-IO configuration. To access this screen from the Main screen, press the right arrow until the Chipset screen is chosen.



Setup Item	Options	Help Text	Comments
Chipset Screen			
System Agent (SA) Configuration		System Agent (SA) Parameters.	
PCH-IO Configuration		PCH Parameters.	

3.3.1 System Agent (SA) Configuration

The North Bridge Screen allows user to set NB chipset configuration. To access this screen, form the Main screen, choose **Chipset> System Agent (SA) Configuration**.



Aptio Setup - AMI

Chipset

Memory Configuration		Maximum Memory Frequency Selections in Mhz.
Memory RC Version	2.0.2.2	
Memory Speed	2133 MT/s	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Memory Timings (tCL-tRCD-tRP-tRAS)	15-15-15-35	
Controller 0 Channel 0 Slot 0 Size	Populated & Enabled 4096 MB (DDR4)	
Controller 0 Channel 0 Slot 1	Not Populated / Disabled	
Controller 1 Channel 0 Slot 0	Not Populated / Disabled	
Controller 1 Channel 0 Slot 1	Not Populated / Disabled	
Maximum Memory Frequency	[Auto]	

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Aptio Setup - AMI

Chipset

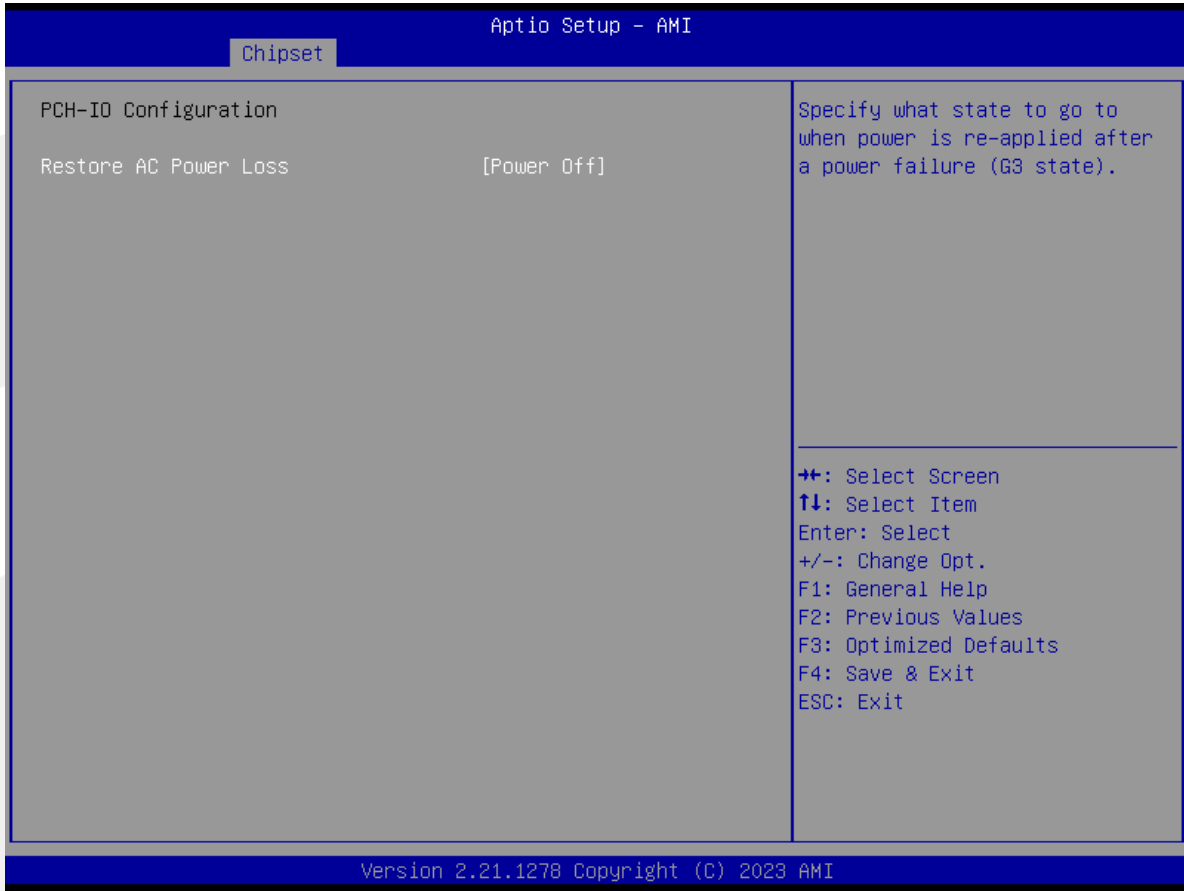
Graphics Configuration		Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for Hybrid Gfx.
Primary Display	[Auto]	
Select PCIE Card	[Auto]	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Internal Graphics	[Auto]	
GTT Size	[8MB]	
Aperture Size	[256MB]	
DVMT Pre-Allocated	[60M]	
DVMT Total Gfx Mem	[256M]	
▶ LCD Control		

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Setup Item	Options	Help Text	Comments
System Agent (SA) Configuration			
Memory Configuration			
Memory Information		Show Memory information.	
Graphics Configuration			
Primary Display	Auto IGFX PEG PCH	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for Hybrid Gfx.	
Internal Graphics	Auto Disabled Enabled	Keep IGFX enabled based on the setup options.	
GTT Size	2MB 4MB 8MB	Select the GTT Size.	
Aperture Size	128MB 256MB 512MB 1024MB 2048MB	Select the Aperture Size. Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.	
DVMT Total Gfx Mem	128M 256M MAX	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.	

3.3.2 PCH-IO Configuration

The South Bridge Screen allows user to set SB chipset configuration. To access this screen from the Main screen, choose **Chipset > PCH-IO Configuration**.



Setup Item	Options	Help Text	Comments
PCH-IO Configuration			
Restore AC Power Loss	Power on Power off	Select AC power state when power is re-applied after a power failure.	

3.4 Security

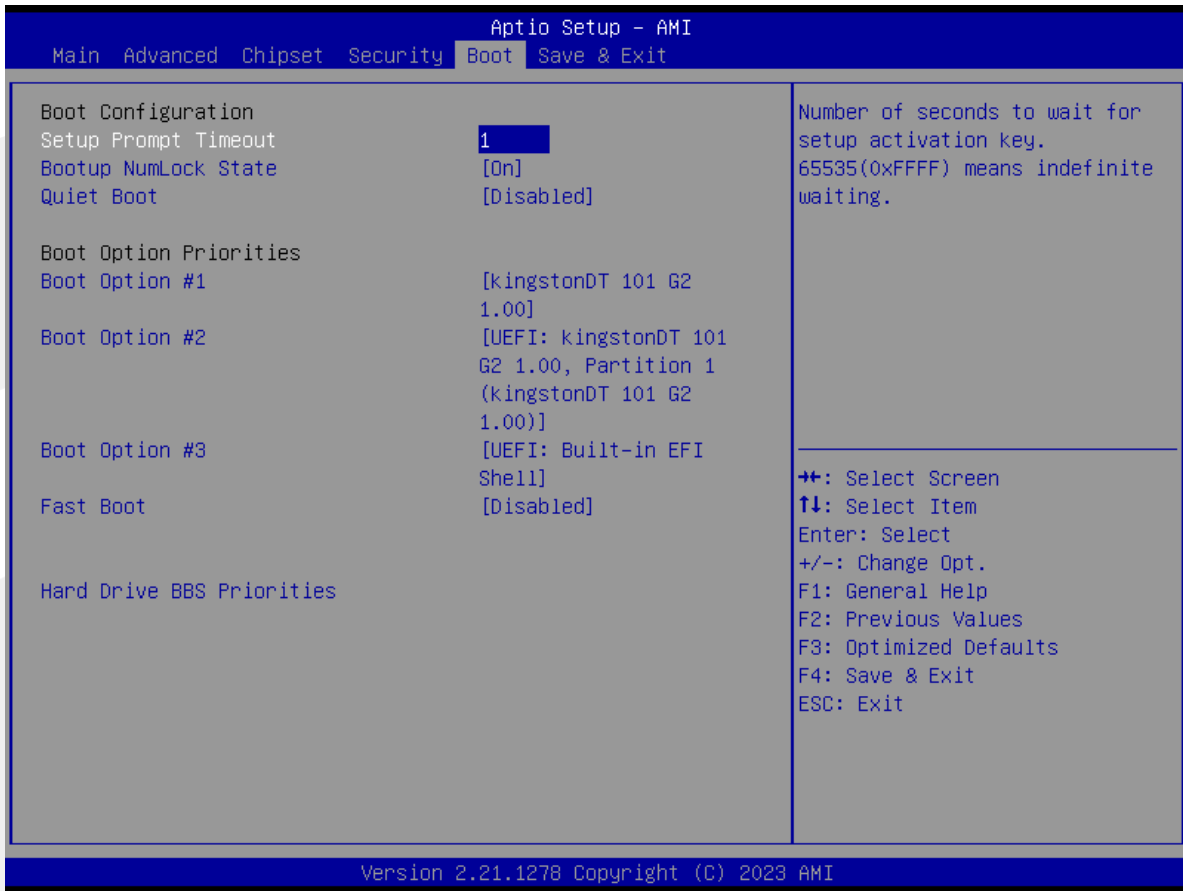
To access this screen from the Main screen, choose **Security**.



Setup Item	Options	Help Text	Comments
Security			
Administrator Password		Set Administrator Password.	
User Password		Set User Password.	

3.5 Boot Screen

The Boot screen displays any bootable media encountered during POST, and allows the user to configure desired boot device. To access this screen from the Main screen, choose **Boot**.

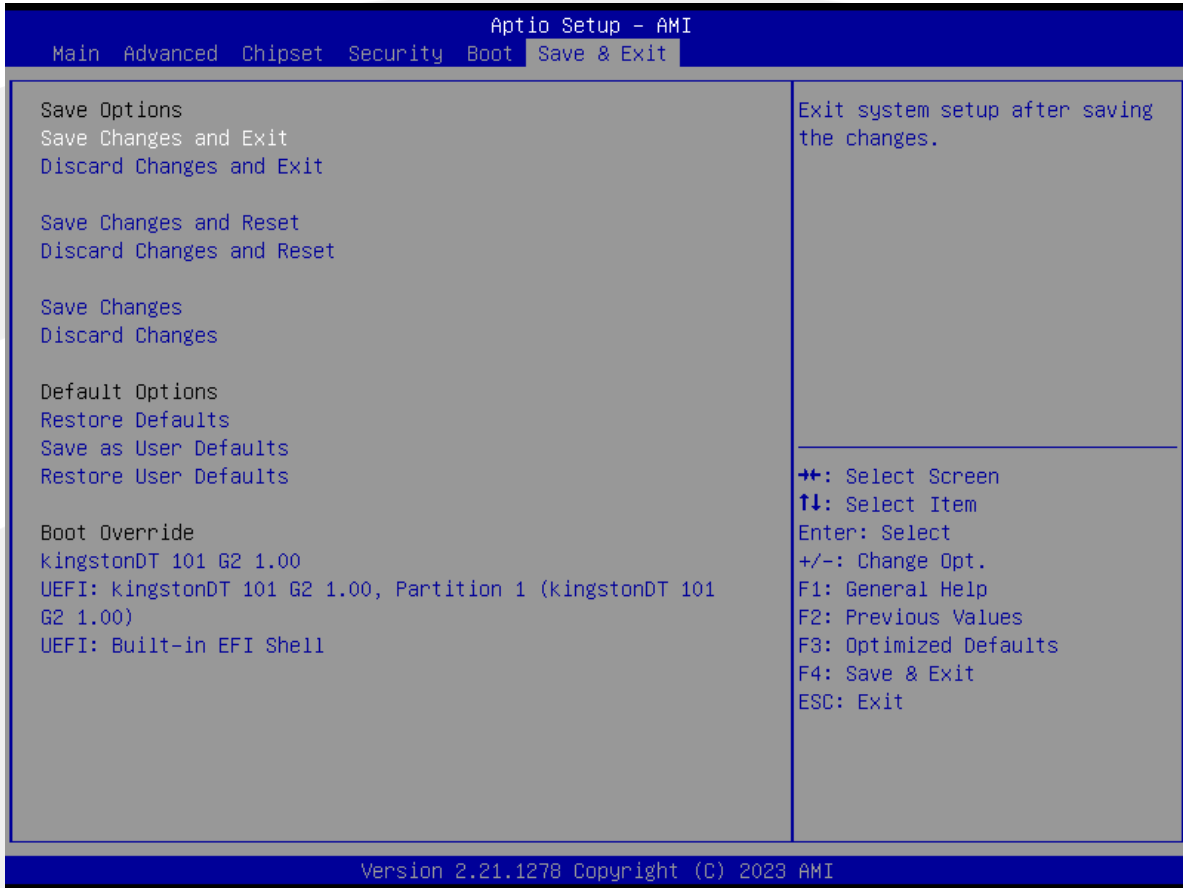


Setup Item	Options	Help Text	Comments
Boot Configuration			
Setup Prompt Timeout	1~65535	Number of seconds to wait for setup activation key.65535(0xFFFF) means indefinite waiting.	Setup Prompt Timeout.
Bootup NumLock State	On off	Select the keyboard Number state.	Bootup NumLock State.
Quiet Boot	Disabled Enabled	Enables or disables Quiet Boot option.	Quiet Boot.
Boot Option Priorities			
Boot Option #1		Sets the system boot order.	Note: Showed When boot devices existed.
Boot Option #2		Sets the system boot order.	
Boot Option #3		Sets the system boot order.	

Setup Item	Options	Help Text	Comments
Fast Boot	Disabled		
Hard Drive BBS Priorities		Set the order of the legacy devices in this group.	Set boot order in each group of the same kind, such as HDD, network

3.6 Save & Exit Screen

The Save & Exit screen allows the user to choose whether to save or discard the configuration changes made on the other screens. It also allows the user to restore the server to the factory defaults or to save or restore them to set of user-defined default values.



Setup Item	Options	Help Text	Comments
Save & Exit			
Save Options			
Save Changes and Exit		Exit system setup after saving the changes.	User is prompted for confirmation only if any of the setup fields were modified.
Discard Changes and Exit		Exit system setup without saving any changes.	
Save Changes and Reset		Reset the system after saving the changes.	
Discard Changes and Reset		Reset system setup without saving and changes.	
Save Changes		Save Changes done so far to any of the setup options.	
Discard Changes		Discard Changes done so far to any or the setup options.	

Setup Item	Options	Help Text	Comments
Default Options			
Restore Defaults		Restore/Load Default values for all the setup options.	
Save as User Defaults		Save the changes done so far as User Defaults.	
Restore User Defaults		Restore the User Defaults to all the setup options.	
Boot Override			
Shows the Device can boot.			Note: Showed When boot devices existed.

第四章 Electrical Specifications

4.1 Input Power - General Considerations

The Compact, Basic and Extended Module Modules shall use a single main power rail with a nominal value of +12V. The Mini Module shall support a wide range power supply of 4.75V to 20.0V. In addition, the Mini Module shall be optimized for 5V operation and Module vendors should report Module power figures at 5V, 12V and 18V input voltages.

Two additional rails are specified: a +5V standby power rail and a +3V battery input to power the Module Real-time Clock (RTC) circuit in the absence of other power sources. The +5V standby rail may be left unconnected on the Carrier Board if the standby functions are not required by the application. Likewise, the +3V battery input may be left open if the application does not require the RTC to keep time in the absence of the main and standby sources. There may be Module specific concerns regarding storage of system setup parameters that may be affected by the absence of the +5V standby and / or the +3V battery.

The rationale for this power-delivery scheme is:

- Module pins are scarce. It is more pin-efficient to bring power in on a higher voltage rail.
- Single supply operation is attractive to many users.
- Lithium ion battery packs for mobile systems are most prevalent with a +14.4V output. This is well suited for the +12V main power rail.
- Contemporary chipsets have no power requirements for +5V other than to provide a reference voltage for +5V tolerant inputs. No COM Express Module pins are allocated to accept +5V except for the +5V standby pins. In the case of an ATX supply, the switched (non standby) +5V line would not be used for the COM Express Module, but it might be used elsewhere on the Carrier Board.

4.2 Input Power - Current Load

The Module connector pins limit the amount of power that can be brought into the COM Express Module. The limits are different for Module Pin-out Type 10 vs. Pin-out Types 6 and 7, based on the number of 12V power pins as Pin-out Type 10 has fewer pins available.

Table 4.1: Input Power - Pin-Out Type 10 Modules (Single Connector, 220 pins)

Power Rail	Module Pin Current Capability (Amps)	Nominal Input (Volts)	Input Range (Volts)	Derated Input (Volts)	Max Input Ripple (mV)	Max Module Input Power (w. derated input) (Watts)	Assumed Conversion Efficiency	Max Load Power (Watts)
VCC_12V	6	12	11.4 - 12.6	11.4	+/-100	68	85%	58
Wide input (Mini)	6		4.75 - 20.0	4.75	+/-100	28		
VCC_5V_SBY	2	5	4.75 - 5.25	4.75	+/-50	9		
VCC_RTC	0.5	3	2.0 - 3.3		+/-20			

Table 4.2: Input Power - Pin-Out Type 6/7 Modules (Dual Connector, 440 pins)

Power Rail	Module Pin Current Capability (Amps)	Nominal Input (Volts)	Input Range (Volts)	Derated Input (Volts)	Max Input Ripple (mV)	Max Module Input Power (w. derated input) (Watts)	Assumed Conversion Efficiency	Max Load Power (Watts)
VCC_12V	12	12	11.4 - 12.6	11.4	+/-100	137	85%	116
VCC_5V_SBY	2	5	4.75 - 5.25	4.75	+/-50	9		
VCC_RTC	0.5	3	2.0 - 3.3		+/-20			

The ripple voltage, if present, must not cause the input voltage range to be exceeded.

4.3 Input Power - Sequencing

COM Express input power sequencing requirements are as follows:

- VCC_RTC shall come up at the same time or before VCC_5V_SBY comes up(if use)
 - VCC_5V_SBY shall come up at the same time or before VCC_12V comes up(if use)
 - PWR_OK shall be active at the same time or after VCC_12V comes up(if use)
 - PWR_OK shall be inactive at the same time or before VCC_12V goes down(if use)
 - VCC_12V shall go down at the same time or before VCC_5V_SBY goes down
 - VCC_5V_SBY shall go down at the same time or before VCC_RTC goes down(if use)
- Wide input (Mini) shall follow the power sequencing of the VCC_12V

Figure 4-1: Power Sequencing

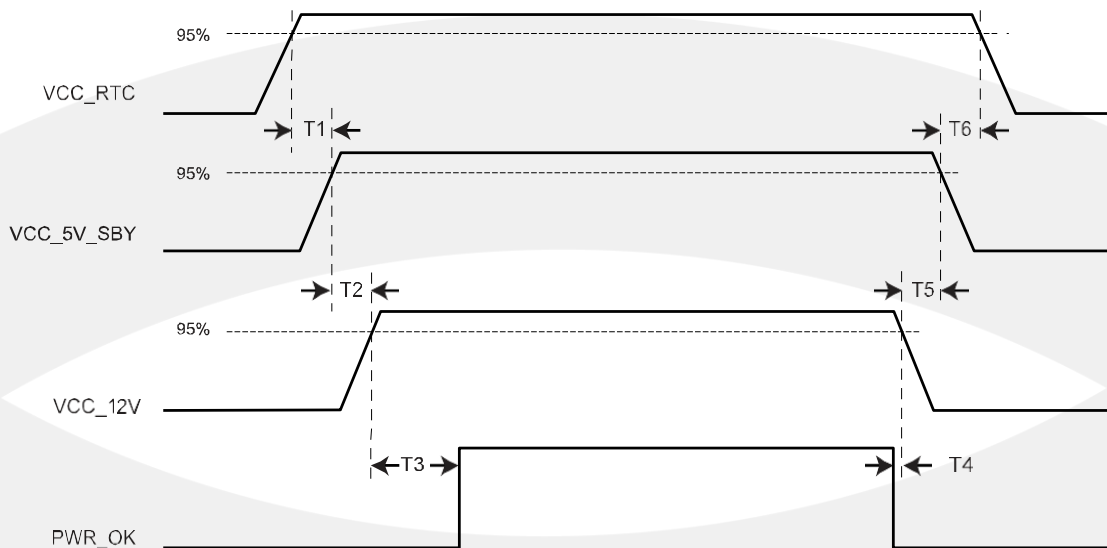


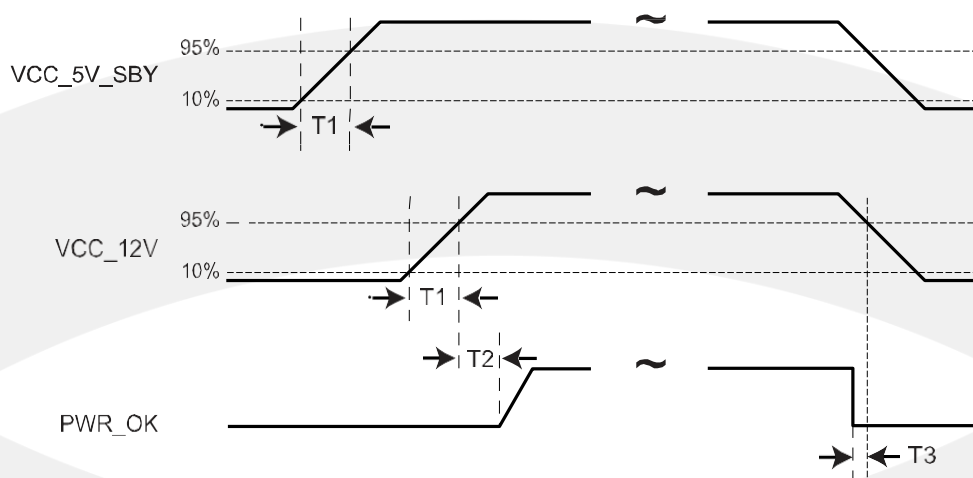
Table 4.3: Power Sequencing

T1	VCC_RTC rise to VCC_5V_SBY rise	≥ 0 ms
T2	VCC_5V_SBY rise to VCC_12V rise	≥ 0 ms
T3	VCC_12V rise to PWROK rise	≥ 0 ms
T4	PWR_OK fall to VCC_12V fall	≥ 0 ms
T5	VCC_12V fall to VCC_5V_SBY fall	≥ 0 ms
T6	VCC_5V_SBY fall to VCC_RTC fall	≥ 0 ms

4.4 Input Power - Rise Time

The input voltages to the COM Express Module VCC_12V, wide input (Mini) and VCC_5V_SBY if used shall rise from $\leq 10\%$ of nominal to within the regulation ranges within 0.1 ms to 20 ms ($0.1 \text{ ms} \leq T_2 \leq 20 \text{ ms}$). There must be a smooth and continuous ramp of each DC output voltage from 10% to 90% of its final set point within the regulation band. The smooth turn-on requires that, during the 10% to 90% portion of the rise time, the slope of the turn-on waveform must be positive and have a value of between 0 V/ms and $[\text{Vout, nominal} / 0.1] \text{ V/ms}$. Also, for any 5ms segment of the 10% to 90% rise time waveform, a straight line drawn between the end points of the waveform segment must have a slope $\geq [\text{Vout, nominal} / 20] \text{ V/ms}$.

Figure 4-2: Input Power Rise Time



- $T_{1,\text{min}} = 0,1\text{ms}$
- $T_{1,\text{max}} = 20\text{ms}$
- $T_2 \geq 0\text{ms}$
- $T_3 \geq 0\text{ms}$

The values chosen were selected to be compatible and enable use of ATX specification R2.2.

4.5 Signal Integrity Requirements

The signal groups listed in the following table have signal-integrity concerns that should be accounted for in Module and Carrier Board designs. A general description is shown in the table for reference only. The designer should consult the relevant interface specification documents for complete information.

Table 4.4: Signal Integrity Requirements

Signal Group	General Description	Source Spec Reference
Gigabit Ethernet	Differential pairs	IEEE 802.3 Specification
LVDS	100Ω edge coupled differential pairs	National Semiconductor LVDS web site
PCI and LPC clocks	50Ω single ended ground-referenced	
PCI Express	Differential pairs	PCI SIG - PCI Express Specification
PCI Express clocks	100Ω edge couple differential pair, ground-referenced	
Serial ATA	Differential pairs	SATA Specification
USB	Differential pairs	USB 2.0 Specification
10GBASE-KR	Differential pairs	IEEE 802.3 Specification
USB SS	Differential pairs	USB 3.0 Specification
SPI	50Ω single ended ground-referenced	
eSPI	50Ω single ended ground-referenced	

附录

附一：术语表

ACPI 高级配置和电源管理

ACPI 规范允许操作系统控制计算机及其附加设备的大部份电能。

BIOS 基本输入/输出系统

是在 PC 中包含所有的输入/输出控制代码界面的软件。它在系统启动时进行硬件检测，开始操作系统的运作，在操作系统和硬件之间提供一个界面。BIOS 是存储在一个只读存储器芯片内。

BUS 总线

在计算机系统中，不同部件之间交换数据的通道，是一组硬件线路。我们所指的 BUS 通常是 CPU 和主内存元件内部的局部线路。

Chipset 芯片组

是为执行一个或多个相关功能而设计的集成芯片。我们指的是由南桥和北桥组成的系统级芯片组，他决定了主板的架构和主要功能。

CMOS 互补金属

氧化物半导体。是一种被广泛应用的半导体类型。它具有高速、低功耗的特点。我们指的 CMOS 是在主板上的 CMOS RAM 中预留的一部份空间，用来保存日期、时间、系统信息和系统参数设定信息等。

COM 串口

一种通用的串行通信接口，一般采用标准 DB9 公头接口连接方式。

DIMM 双列直插式内存模块

是一个带有内存芯片组的小电路板。提供 64bit 的内存总线宽度。

DRAM 动态随机存取存储器

是一个普通计算机的通用内存类型。通常用一个晶体管和一个电容来存储一个位。随着技术的发展，DRAM 的类型和规格已经在计算机应用中变得越来越多样化。例如现在常用的就有 SDRAM、DDR SDRAM 和 RDRAM。

L2c

Inter-Integrated Circuit 总线是一种由 PHILIPS 公司开发的两线式串行总线，用于连接微控制器及其外围设备。

LAN 局域网络接口

一个小区域内相互关联的计算机组成的一个计算机网络，一般是在一个企事业单位或一栋建筑物。局域网一般由服务器、工作站、一些通信链接组成，一个终端可以通过电线访问数据和设备的任何地方，许多用户可以共享昂贵的设备和资源。

LED 发光二极管

一种半导体设备，当电流流过时它会被点亮，通常用来把信息非常直观地表示出来，例如表示电源已经导通或硬盘驱动器正在工作等。

PnP 即插即用

允许 PC 对外接设备进行自动配置，不用用户手动操作系统就可以自己工作的一种规格。为实现这个特点，BIOS 支持 PnP 和一个 PnP 扩展卡都是必需的。

POST 上电自检

在启动系统期间，BIOS 会对系统执行一个连续的检测操作，包括检测 RAM，键盘，硬盘驱动器等，看它们是否正确连接和是否正常工作。

PS/2

由 IBM 发展的一种键盘和鼠标连接的接口规范。PS/2 是一个仅有 6PIN 的 DIN 接口，也可以用以连接其他的设备，比如调制解调器。

USB 通用串行总线

一种适合低速外围设备的硬件接口，一般用来连接键盘、鼠标等。一台 PC 最多可以连接 127 个 USB 设备，提供一个 12Mbit/s 的传输带宽；USB 支持热插拔和多数数据流功能即在系统工作时可以插入 USB 设备，系统可以自动识别并让插入的设备正常。

深圳智锐通科技有限公司
Shenzhen Zrt Co., Ltd.



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&



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