

ACM-EL6KE0-Ax

COM Express Mini Module Type 10 with $\mbox{Intel}^{\mbox{\scriptsize \ensuremath{\mathbb{R}}}}$ Elkhart Lake



User Manual

Acrosser Technology Co., Ltd. www.acrosser.com



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Purpose

This document is intended to provide the information about the features and use of the product.

Audience

The intended audiences are technical personnel, not for general audiences.

WARNING

Danger of explosion if batteries are incorrectly replaced. Always replace the battery with the same specifications. Dispose of used batteries according to the manufacturer's instructions.

Before running the system, make sure the power cord is firmly plugged into the socket.

CAUTION



IEC 60417-6172 (2012-09)

All power cords must be disconnected during product repair.

Ver: 100 Date: Mar. 6, 2023

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1. Introduction

Introducing the latest addition to Acrosser's COM Express Type 10 product line the ACM-EL6KE0-Ax. Powered by an Intel Elkhart Lake entry-level processor, this product boasts an impressive 16GB DDR4 memory and 64GB EMMC on board, making it stand out from the Standard Type 10 with 4 PCIe x1 Lanes. With its mini form factor of just 84mm x 55mm, it meets the popular COM Express standard and can easily fulfill all of your embedded requirements, bringing your ideas to life.

The ACM-EL6KE0-Ax is available with two different CPU grades, providing flexibility for your applications in highly variable environments. Whether you need a powerful processor for intensive tasks or a more cost-effective option for simple applications, this product has got you covered.

Upgrade your embedded systems with the ACM-EL6KE0-Ax, and experience the power and versatility you need for your next project.

1.1. Specifications

CPU	 ACM-EL6KE0-A1: Intel[®] Elkhart Lake Intel Atom[®] x6425E Processor, 2.00GHz up to 3GHz, 4C, 4T, 1.5MB cache, 12W
	 ACM-EL6KE0-A2: Intel[®] Elkhart Lake Intel Pentium[®] J6426Processor, 2.00GHz up to 3GHz, 4C, 4T, 1.5MB cache, 10W
Chipset	Intel [®] SoC
GPU	 Intel[®] UHD Graphics for 10th Gen Intel[®] Processors
Display	1x LVDS/eDP
	1x DDI port
LVDS	Supports 18/24bit Single channel
BIOS	AMI UEFI
Memory	ACM-EL6KE0-A1: Onboard LPDDR4x 4266 memory 8G
	 ACM-EL6KE0-A2: Onboard LPDDR4x 4266 memory 16G
Storage	Onboard EMMC 64GB
Ethernet	1x Intel [®] I226AT/IT 2.5GbE0
SATA	• 2x SATA III (6.0Gb/s)
USB	• 8x USB2.0
	• 2x USB3.2 Gen2
Audio	1x Intel High Definition Audio Interface
Serial Port	2x wire UART (Only TX & RX)



GPIO	•	8 bit
Expansion	•	4x PCI Express 3.0 lanes 4 PCIe x1 I2C LPC SMBus
OS Support	•	Windows 10 Linux Kernel 64-bit
Watchdog Timer	•	Software programmable 0~255 seconds, 0 = disable timer.
Power Mode	•	AT/ATX Mode (by jumper setting)
Operating Temperature	•	-40°C ~ 85°C
Dimension	•	84 mm x 55 mm (3.31" x 2.17") COM Express type 10
Safety	•	CE, FCC Class A

1.2. Packing List

Check if the following items are included in the package.

Item	Q'ty
ACM-EL6KE0-A1	1
or ACM-EL6KE0-A2	
CPU Cooler	1



1.3. Block Diagram





2. Hardware Information

2.1. Mainboard Layout

Top View



Bottom View





2.2. Row A/B Pin Assignments (CN1)

Pin #	Row A	Pin #	Row B
A1	GND (FIXED)	B1	GND (FIXED)
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK1000#	B4	LPC_AD0
A5	GBE0_LINK2500#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK#	B8	N.C.
A9	GBE0_MDI1-	B9	N.C.
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND (FIXED)	B11	GND (FIXED)
A12	GBE0_MDI0-	B12	PWRBTN#
A13	GBE0_MDI0+	B13	SMB_CK
A14	N.C.	B14	SMB_DAT
A15	SUS_S3#	B15	SMB_ALERT#
A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	SUS_STAT#
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND (FIXED)	B21	GND (FIXED)
A22	USB3_RXN0	B22	USB3_TXN0
A23	USB3_RXP0	B23	USB3_TXP0
A24	SUS_S4#	B24	PWR_OK
A25	USB3_RX1_N	B25	USB3_TX1_N
A26	USB3_RX1_P	B26	USB3_TX1_P
A27	BATLOW#	B27	WDT
A28	ATA_ACT#	B28	N.C.
A29	AC_SYNC	B29	N.C.
A30	AC_RST#	B30	AC_SDIN0
A31	GND (FIXED)	B31	GND (FIXED)
A32	AC_BITCLK	B32	SPKR



Pin #	Row A	Pin #	Row B
A33	AC_SDOUT	B33	I2C_CK
A34	BIOS_DIS0#	B34	I2C_DAT
A35	THRMTRIP#	B35	THRM#
A36	USB6-	B36	USB7-
A37	USB6+	B37	USB7+
A38	USB_6_7_OC#	B38	USB_4_5_OC#
A39	USB4-	B39	USB5-
A40	USB4+	B40	USB5+
A41	GND (FIXED)	B41	GND (FIXED)
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	N.C.
A48	N.C.	B48	N.C.
A49	N.C.	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND (FIXED)	B51	GND (FIXED)
A52	N.C.	B52	N.C.
A53	N.C.	B53	N.C.
A54	GPI0	B54	GPO1
A55	N.C.	B55	N.C.
A56	N.C.	B56	N.C.
A57	GND	B57	GPO2
A58	PCIE_TX3+	B58	PCIE_RX3+
A59	PCIE_TX3-	B59	PCIE_RX3-
A60	GND (FIXED)	B60	GND (FIXED)
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-
A63	GPI1	B63	GPO3
A64	PCIE_TX1+	B64	PCIE_RX1+
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND	B66	WAKE0#



Pin #	Row A	Pin #	Row B
A67	GPI2	B67	WAKE1#
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND (FIXED)	B70	GND (FIXED)
A71	LVDS_A0+(EDP_TX2_P)	B71	DDI0_PAIR0+
A72	LVDS_A0-(EDP_TX2_N)	B72	DDI0_PAIR0-
A73	LVDS_A1+(EDP_TX1_P)	B73	DDI0_PAIR1+
A74	LVDS_A1-(EDP_TX1_N)	B74	DDI0_PAIR1-
A75	LVDS_A2+(EDP_TX0_P)	B75	DDI0_PAIR2+
A76	LVDS_A2-(EDP_TX0_N)	B76	DDI0_PAIR2-
A77	LVDS_VDD_EN(EDP_VDDEN_3_3)	B77	N.C.
A78	LVDS_A3+	B78	N.C.
A79	LVDS_A3-	B79	LVDS_BKLD_EN(EDP_BKLTEN_3_3)
A80	GND (FIXED)	B80	GND (FIXED)
A81	LVDS_A_CK+(EDP_TX3_P)	B81	DDI0_PAIR3+
A82	LVDS_A_CK-(EDP_TX3_N)	B82	DDI0_PAIR3-
A83	LVDS_I2C_CK(EDP_AUXP)	B83	EDP_BKLT_CTRL
A84	LVDS_I2C_DAT(EDP_AUXN)	B84	VCC_5V_SBY
A85	GPI3	B85	VCC_5V_SBY
A86	EC_KBRST#	B86	VCC_5V_SBY
A87	DDI0_HPD_3.3S(eDP use)	B87	VCC_5V_SBY
A88	PCIE0_CK_REF+	B88	BISO_DIS1#
A89	PCIE0_CK_REF-	B89	DDI0_HPD
A90	GND (FIXED)	B90	GND (FIXED)
A91	SPI_POWER	B91	N.C.
A92	SPI_MISO	B92	N.C.
A93	GPO0	B93	N.C.
A94	SPI_CLK	B94	N.C.
A95	SPI_MOSI	B95	DDI0_DDC_AUX_SEL
A96	GND	B96	N.C.
A97	TYPE10#	B97	SPI_CS#
A98	RS1_TX	B98	DDI0_CTRL_CLK
A99	RS1_RX	B99	DDI0_CTRL_DATA
A100	GND (FIXED)	B100	GND (FIXED)





Pin #	Row A	Pin #	Row B
A101	RS2_TX	B101	FAN_PWMOUT
A102	RS2_RX	B102	FAN_TACHIN
A103	LID#	B103	SLEEP#
A104	VCC_12V	B104	VCC_12V
A105	VCC_12V	B105	VCC_12V
A106	VCC_12V	B106	VCC_12V
A107	VCC_12V	B107	VCC_12V
A108	VCC_12V	B108	VCC_12V
A109	VCC_12V	B109	VCC_12V
A110	GND (FIXED)	B110	GND (FIXED)



2.3. Board Dimension

(Unit: mm)











3. BIOS Settings

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press or <F2> immediately while your computer is powering up.

The function for each interface can be found below.

- Main Date and time can be set here. Press <Tab> to switch between date elements
- Advanced Enable/ Disable boot option for legacy network devices
- System I/O For configuring PCI Express settings
- · Security The setup administrator password can be set here
- Boot Enable/ Disable Quiet Boot option
- · Save & Exit –Save your changes and exit the program

3.1. Main Setup

Main Advanced System I/O Securi	Aptio Setup – AMI ty Boot Save & Exit			
== BIOS Information == ACM-EL6KE0 V1.0 (xx/xx/2023)		Set the Date. Use Tab to switch between Date elements. Default Ranges:		
== EC Information == (V0426E03)(4/19/2022)		Year: 1998–2199 Months: 1–12 Days: dependent on month		
== CPU Information == Intel Atom(R) x6413E Processor @ 1.	50GHz			
== MEM Information == Total Memory	8192 MB			
Memory Data Rate	3200 MTPS			
== SATA Information ==	Emptu	++: Select Screen		
SATA Port 1	Empty	Enter: Select +/-: Change Opt.		
System Date System Time	[Fri 01/01/2021] [00:02:39]	F1: General Help F2: Previous Values F3: Ontimized Defaults		
Access Level	Administrator	F4: Save & Exit ESC: Exit		
Version 2.21.1278 Copyright (C) 2022 AMI				



3.2. Advanced Setup

Main Advanced System I/O Security	Aptio Setup - AMI Boot Save & Exit	
Display Information ▶ Graphics Configuration		Graphics Configuration
System Information • CPU Configuration • Memory Configuration • On-Module H/H Monitor • PCH-FW Configuration		
 On-Module FEATURES Power Management BIOS Robot 		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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3.2.1. Graphics Configuration





3.2.1.1. LVDS Panel Configuration

Advanced	Aptio Setup – AMI	
LVDS Panel Configuration		Enable/Disabled this panel
LVDS Panel Type Color Depth Backlight Mode	[Enabled] [1024x760060H2] [18-Bit] [Windows Slider]	+: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.21.1278 Copyright (C) 20	022 AMI

- LVDS
 Enable/Disable LVDS.
- Panel Type

Select LCD panel used by internal graphics device by selecting the appropriate setup item.

- Color Depth Select panel type.
- Backlight Mode
 Select backlight control signal type



3.2.2. CPU Configuration

Active Processor Cores

Number of cores to enable in each processor package.

• Turbo Mode

Enable/Disable processor Turbo Mode (requires EMTTM enabled too).

• Hyper-Threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).

- Intel(R) SpeedStep(tm) Allows more than two frequency ranges to be supported.
- Intel (VMX) Virtualization Technology VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.



3.2.3. Memory Configuration

Advanced	Aptio Setup – AMI	
Memory Configuration		
Memory RC Version Total Memory Memory Data Rate Memory Timings (tCL-tRCD-tRP-tRAS) Controller 0 Channel 0 Slot 0	0.0.4.104 B192 MB 3200 MTPS 28-29-29-68 N/A	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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3.2.4. On-Module H/W Monitor

Advanced	Aptio Setup — AMI	
Pc Health Status		Smart Fan Configuration
Thermal Source 1(T1) Thermal Source 2(T2)	: +40 °c : +39 °c	
FAN 1	: N/A	
5VSB +12V VMEM	: +5.088 V : +11.998 V : +1.104 V	
▶ Fan 1 Mode Configuration		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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3.2.4.1. Fan 1 Mode Configuration

Fan 1: Full Mode

Advanced	Aptio Setup – AMI	
FAN 1 PWM signal	[Full Mode] [Non-inverting]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	/ersion 2.21.1278 Copyright (C) 202	22 AMI

Fan 1: Manual Mode by PWM

Advanced	Aptio Setup — AMI	
FAN 1 FWM signal Manual Setting	[Manual Mode by PHM] [Non-inverting] 70	+: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit



Fan 1: Auto Mode by PWM

Advanced	Aptio Setup – AMI	
PAN 1 PWM signal Monitor Thermal Temperature Of Start Temperature of Off Start PWM Slope (PWM)	[Auto Mode by PHM] [Non-inverting] [Thermal Source 1(Ti)] 30 20 40 [1 (PHM)]	
		+: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

3.2.5. PCH-FW Configuration

Advanced	Aptio Setup — AMI	
ME Firmware Version ME Firmware Mode ME Firmware SKU ME Firmware Status 1 ME Firmware Status 2 • Firmware Update Configuration	15.40,10.2252 Normal Hode Consumer SKU 0x90000255 0x89100106	Configure Management Engine Technology Parameters
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version	12.21.1278 Copyright (C) 202	2 AMI



3.2.5.1. Firmware Update Configuration

Advanced	Aptio Setup – AMI	
He FW Image Re-Flash FW Update	(Disabled) [Enabled]	Enable/Disable Me FW Image Re-Flash function. ++: Select Screen T4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Ve	rsion 2.21.1278 Copyright (C)	2022 AMI

- Me FW Image Re-Flash Enable/Disable Me FW Image Re-Flash function.
- Local FW Update Enable/Disable ME FW Update function.



3.2.6. On-Module Configuration

Advanced	Aptio Setup – AMI	
Battery Managerment EC-SMB-HC Support	(Disabled) (Disabled)	Enable to support battery in ACPI OS by I2C_CK,I2C_DAT(B33,B34)
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.21.1278 Copyright (C) 202	2 AMI

- Battery Management Enable to support battery in ACPI OS by I2C_CK, I2C_DAT.
- EC-SMB-HC Support SMBus Host Controller Interface via Embedded Controller.



3.2.7. Power Management

Advanced	Aptio Setup — AMI	
Power Management		Select system power mode.
Power Mode Restore AC Power Loss	(ATX Type) [Last State]	
Wake Events RTC wake system from S5	(Disabled)	
		++: Select Screen T4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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- Power Mode Select system power mode.
- Restore AC Power Loss Set Power Loss State.

RTC wake system from S5

Fixed Time: System will wake on the hr:min:sec specified.

Dynamic Time: System will wake on the current time + Increase minute(s) Bypass: BIOS will not control RTC wake function during system shutdown



3.2.8. BIOS Robot

Advanced	Aptio Setup – AMI	
BIOS Robot Sends watch dog before BIOS POST POST Timer (second) Sends watch dog before booting OS OS Timer (minute) Delayed POST (PEI phase) Delayed Time (second) Delayed Time (second) Reset system once Soft on hard reset > Device detecting configuration	[Disabled] 30 [Disabled] 3 [Disabled] 10 [Disabled] [Soft reset]	Enabled - Robot set Watch Dog Timer(WDT) right after power on, before BIDS start POST process. And then Robot will clear WDT on compeletion of POST. MDT will reset system automatically if it is not cleared before its timer counts down to zero. ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save Exit ESC: Exit
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• Sends watch dog before BIOS POST

Robot set Watch Dog Timer (WDT) right after power on, before BIOS start POST process. And then Robot will clear WDT on completion of POST. WDT will reset system automatically if it is not cleared before its timer counts down to zero.

• Sends watch dog before booting OS

Robot set Watch Dog Timer (WDT) after POST completion, before BIOS transfer control to OS.

WARNING: Before enabling this function, a program in OS must be in responsible for clearing WDT. Also, this function should be disabled if OS is going to update itself.

• Delayed POST (PEI phase)

Robot holds BIOS from starting POST, right after power. This allows BIOS POST to start with stable power or start after system is physically warmed-up.

Delayed POST (DXE phase)

Robot holds BIOS before POST completion. This allows BIOS POST to start with stable power or start after system is physically warmed-up.

Reset System once

Robot resets system for one time on each boot. This will send a soft or hard reset to onboard devices, thus puts devices to more stable state.



3.2.8.1. Device Detecting Configuration

Advanced	Aptio Setup – AMI	
Device detecting configuration > Device #1 detecting configuration > Device #2 detecting configuration > Device #3 detecting configuration > Device #4 detecting configuration > Device #5 detecting configuration If any device is detected in unexpect	ed	Device #1 detecting configuration
condition, the robot will do followin Action Soft or hard reset Retry-Count At time	ng [Reset System] [Soft] 3 [After show logo]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt, F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2		

Action
 Select action that a

Select action that robot should do.

• Soft or hard reset

Select reset type robot should send on each boot.

Retry-Count

Robot will reset system at most counter times, and then let system continue its POST.

At time

Select robot action time.



3.2.8.1.1. Device #1~5 Detecting Configuration

Advanced	Aptio Setup — AMI	
Device #1 detecting configuration		Select interface robot should use to communicate with device
Robot detects device with Interface		
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Robot detects device with Interface
 Select interface robot should use to communication with device.

3.3. System I/O Setup

Aptio Setup – AMI Main Advanced <mark>System I/O</mark> Security Boot Save & Exit	
System I/O > PCI Express Configuration > Storage Configuration > HD Audio Configuration > Digital IO Port Configuration > SID Configuration > Serial Port Console Redirection > SCS Configuration	PCI Express Configuration settings
	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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3.3.1. PCI Express Configuration

System I/O	Aptio Setup – AMI	
PCH PCIE Configuration PCIE Controlleri Select PCI Express 0 PCIE Speed Hot Plug PCI Express 1 PCIE Speed Hot Plug	[PCIE Controller are four x1] [Enabled] [Auto] [Disabled] [Enabled] [Auto] [Disabled] [Enabled]	PCIE Controller Selection
PCIE Speed Hot Plug PCI Express 3 PCIE Speed Hot Plug	(Auto) (Disabled) (Enabled) (Auto) (Disabled)	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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- PCIe Controller1 Select PCIE Controller Selection.
- PCI Express 0/1/2/3 Control the PCI Express Root Port.
- PCle Speed
 Configure PCle Speed.
- Hot Plug
 PCI Express Hot Plug Enable/Disable.



3.3.2. Storage Configuration

System I/O	Aptio Setup – AMI	
System 1/0 NVMe Configuration SATA Controller(s) SATA Port 0 Software Preserve Port 0 Hot Plug Configured as eSATA SATA Device Type SATA Port 1 Software Preserve Port 1 Hot Plug Configured as eSATA SATA Device Type	[Enabled] Empty Unknown [Enabled] [Disabled] Hot Plug supported [Hard Disk Drive] Empty Unknown [Enabled] [Disabled] Hot Plug supported [Hard Disk Drive]	NVMe Device Options Settings ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

- SATA Controller(s)
 Enable/Disable SATA Device.
- Port x Enable or Disable SATA Port.
- Hot Plug Designates this port as Hot Pluggable.

• SATA Device Type

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.



3.3.3. HD Audio Configuration

	Aptio Setup – AMI System I/O	
HD Audio	[Enabled]	Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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HD Audio

Control Detection of the HD-Audio device.

3.3.4. Digital IO Port Configuration

System I/O	Aptio Setup – AMI	
Digital IO Port Configuration		Set DIO as Input or Output
GPIO GPI1 GPI2 GPI3 GPO0 Output Level GPO1 Output Level GPO2 Output Level GPO3 Output Level	[Input] [Input] [Input] [Output] [Output] [Output] [High] [Output] [High] [Output] [High]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>



- GPI0/1/2/3
 GPO0/1/2/3
 Set DIO as Input or Output.
- Output Level
 Set output level when DIO pin is output.

3.3.5. SIO Configuration





3.3.5.1. Serial Port x Configuration



Use This Device

Enable or Disable this Logical Device.

Possible

Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.



3.3.6. Serial Port Console Redirection

System I/O	Aptio Setup — AMI	
COMO Console Redirection ▶ Console Redirection Settings	(Disabled)	Console Redirection Enable or Disable.
COM1 (Disabled) Console Redirection	Port Is Disabled	
Serial Port for Out-of-Band Managemen Windows Emergency Management Services Console Redirection EMS ▶ Console Redirection Settings	nt∕ s (EMS) [Disabled]	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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- COM0 Console Redirection
 Console Redirection Enable or Disable.
- Console Redirection EMS
 Serial Port for Out-of-Band Management/ Windows Emergency Management
 Services (EMS) Console Redirection Enable or Disable.



3.3.7. SCS Configuration

System 1	Aptio Setup – AMI 1/0	
еМНС 5.1 Controller еНИС 5.1 HS400 Mode Enable HS400 software tur Driver Strength	[Enabled] [Enabled] ing [Enabled] [40 Ohm]	Enable or Disable SCS eMMC 5.1 Controller +*: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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- eMMC 5.1 Controller
 Enable or Disable SCS eMMC 5.1 Controller
- eMMC 5.1 HS400 Mode
 Enable or Disable SCS eMMC 5.1 HS400 Mode
- Enable HS400 software tuning Software tuning should improve eMMC HS400 stability at the expense of boot time
- Driver Strength Sets I/O driver strength



3.4. Security Setup

Main Advanced System I/	Aptio Setup – A O Security Boot Save & E	MI xit
Password Description		Set Administrator Password
If ONLY the Administrator then this only limits acce only asked for when enter; If ONLY the User's passwor is a power on password and boot or enter Setup. In Se have Administrator rights. The password length must b in the following range: Minimum length	s password is set, ess to Setup and is ng Setup. d is set, then this i must be entered to etup the User will me 3	
Maximum iength	20	++: Select Screen ↑↓: Select Item
Administrator Password		Enter: Select
User Password		+/−: Change Opt.
 Trusted Computing 		F1: General Help
▶ Secure Boot		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Change User/Administrator Password

You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, and press Enter. In the dialog box, enter your password (must be between 3 and 20 letters or numbers). Press Enter and retype your password to confirm. Press Enter again to set the password.

Removing the Password

Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.



3.4.1. Trusted Computing

Secur	Aptio Setup – AMI <mark>ity</mark>	
TPM 2.0 Device Found Firmware Version: Vendor:	600.15 INTC	Enables or Disables BIOS support for security device. O.S. will not show Security Device ICS FEL protocol and
Security Device Support Active PCR banks Available PCR banks	[Enable] SHA256 SHA-1,SHA256,SHA384,SM3	INTIA interface will not be available.
SHA-1 PCR Bank SHA256 PCR Bank SHA384 PCR Bank SM3_256 PCR Bank	[Disabled] [Enabled] [Disabled] [Disabled]	
Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarchy TFM 2.0 UEFI Spec Version Physical Presence Spec Version TFM 2.0 InterfaceType Device Select	[None] [Enabled] [Enabled] [TC6_2] [1.3] [CRB] [Auto]	+: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.21.1278 Copyright (C) 202	2 AMI

- Security Device Support
 Enable or Disable BIOS support for security device.
- SHA-1 PCR Bank
 Enable or Disable SHA-1 PCR Bank.
- SHA256 PCR Bank
 Enable or Disable SHA256 PCR Bank.
- SHA384 PCR Bank
 Enable or Disable SHA384 PCR Bank.
- SM3_256 PCR Bank
 Enable or Disable SM3_256 PCR Bank.
- **Pending operation** Schedule an operation for the security device.
- Platform Hierarchy
 Enable or Disable Platform Hierarchy
- Storage Hierarchy
 Enable or Disable Storage Hierarchy
- Endorsement Hierarchy Enable or Disable Endorsement Hierarchy
- TPM2.0 UEFI Spec Version
 Select the TCG2 Select Version Support





- Physical Presence Spec Version
 Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3.
- Device Select
 Device select

3.4.2. Secure Boot

	Aptio Setup – AMI Security	
System Mode	Setup	Secure Boot feature is Active
Secure Boot	[Disabled] Not Active	Platform Key(PK) is enrolled and the System is in User mode.
Secure Boot Mode ▶ Restore Factory Keys ▶ Reset To Setup Mode	[Custom]	platform reset
▶ Key Management		
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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Secure Boot

Secure Boot feature is Active if Secure is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset.

Secure Boot Mode

Secure Boot mode selector.



3.4.2.1. Key Management

	Aptio Setup – AMI Security	
Vendor Keys	Valid	Install factory default Secure
Factory Key Provision • Restore Factory Keys • Reset To Setup Mode • Export Secure Boot variables • Enroll Efi Image		neset and while the System is in Setup mode
Device Guard Ready ▶ Remove 'UEFI CA' from DB ▶ Restore DB defaults		
Secure Boot variable Size Platform Key(PK) 0 Key Exchange Keys 0 Authorized Signatures 0 Forbidden Signatures 0 Authorized TimeStamps 0 OsRecovery Signatures 0	Keys Key Source 0 No Keys 0 No Keys 0 No Keys 0 No Keys 0 No Keys 0 No Keys 0 No Keys	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Ve	ersion 2.21.1278 Copyright (C) 2022	AMI

3.5. Boot Setup

Main Advanced System I/O	Aptio Setup – AMI Security <mark>Boot</mark> Save & Exit	
Boot Configuration		Enables or disables Quiet Boot
Quiet Boot Network Stack	[Enabled] [Disabled]	001100
FIXED BOOT ORDER Priorities Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4 Boot Option #5	[USB Device] [Hand Disk] [NVME] [SD] [Network]	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Ve	rsion 2.21.1278 Copyright (C) 202	2 AMI

Quiet Boot

Enable or Disable showing boot logo.



- Network Stack
 Enable/Disable UEFI Network Stack.
- Boot Option #1
 Boot Option #2
 Boot Option #3
 Boot Option #4
 Boot Option #5
 Sets the system boot order for FIXED BOOT ORDER Priorities.

3.6. Save & Exit Setup

Aptio Setup – AMI Main Advanced System I/O Security Boot <mark>Save & Exit</mark>	
Save Options	Reset the system after saving
Save Changes and Reset Discard Changes and Exit	the changes.
Default Options Restore Defaults	
	↔: Select Screen ↑↓: Select Item
	Enter: Select +/-: Change Opt.
	F1: General Help F2: Previous Values F3: Ontimized Defaults
	F4: Save & Exit ESC: Exit
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4. Drivers Installation

4.1. Driver Download and Installation

Drivers for the ACM-EL6KE0-Ax can be downloaded from the product page on the Acrosser website by following this link:

https://www.acrosser.com/en/Support/Download/

Download the driver(s) you need and follow the steps below to install them.

Step 1 – Install Chipset Drivers

- 1. Open the Chipset Driver folder
- 2. Run the SetupChipset.exe file
- 3. Follow the instructions
- 4. Drivers will be installed automatically

• Step 2 – Install Graphics Driver

- 1. Open the Graphics Driver folder.
- 2. Run the igxpin.exe file in the folder
- 3. Follow the instructions
- 4. Drivers will be installed automatically

• Step 3 – Install LAN Drivers*

Note: The download package has been split into a driver package and an Intel® PROSet package. The driver package must be installed prior to installing the Intel® PROSet package.

LAN Driver Installation:

- 1. Open the LAN Drivers folder
- 2. Run the Wired_driver_27.3_x64.exe file
- 3. Follow the instructions
- 4. Drivers will be installed automatically

Intel[®] PROSet Installation:

- 1. Open the LAN Drivers folder
- 2. Run the Wired_PROSet_27.3_x64.exe file
- 3. Follow the instructions
- 4. Drivers will be installed automatically

• Step 4 – Install ME Drivers

- 1. Open the ME Drivers folder
- 2. Run the SetupME.exe file



- 3. Follow the instructions
- 4. Drivers will be installed automatically

• Step 5 – Install Audio Drivers

- 1. Open the Audio Drivers folder
- 2. Run the Setup.exe file
- 3. Follow the instructions
- 4. Drivers will be installed automatically

• Step 6 – Install Serial I/O Drivers

- 1. Open the Serial IO Drivers followed by the folder for the drivers you want to install
- 2. Follow the instructions in the .inf files to install drivers

• Step 7 – Install Intel[®] PSE Drivers (Optional)

- 1. Open the Intel[®] PSE Drivers folder followed by the folder for the drivers you want to install
- 2. Follow the instructions in the .inf files to install drivers

• Step 8 – Install Intel[®] Peripheral Drivers

- 1. Open Intel[®] Peripheral Drivers folder followed by the folder for the drivers you want to install
- 2. Follow the instructions in the .inf files to install drivers



5. Appendix

5.1. I/O Information

5.1.1. I/O Address Map

Input/output (IO) [0000000000000000 - 000000000000CF7] PCI Express Root Complex [0000000000000024 - 000000000000025] Programmable interrupt controller [0000000000000028 - 0000000000000029] Programmable interrupt controller E [00000000000002C - 000000000000002D] Programmable interrupt controller [00000000000002E - 0000000000002F] Motherboard resources Togrammable interrupt controller E [000000000000034 - 000000000000035] Programmable interrupt controller [000000000000003C - 00000000000003D] Programmable interrupt controller timer [0000000000000040 - 0000000000000043] System timer [00000000000004E - 0000000000004F] Motherboard resources [0000000000000061 - 000000000000061] Motherboard resources [0000000000000063 - 00000000000063] Motherboard resources [0000000000000065 - 000000000000065] Motherboard resources [0000000000000067 - 00000000000067] Motherboard resources [0000000000000068 - 000000000000068] Microsoft ACPI-Compliant Embedded Controller to [00000000000006C - 0000000000006C] Microsoft ACPI-Compliant Embedded Controller [00000000000000070 - 00000000000000070] Motherboard resources [0000000000000080 - 00000000000080] Motherboard resources [0000000000000092 - 00000000000092] Motherboard resources E [0000000000000AC - 00000000000000AD] Programmable interrupt controller E [00000000000000B0 - 00000000000000B1] Programmable interrupt controller [000000000000082 - 0000000000083] Motherboard resources [0000000000000084 - 00000000000085] Programmable interrupt controller [000000000000088 - 00000000000089] Programmable interrupt controller [000000000000000BC - 000000000000BD] Programmable interrupt controller [000000000002F8 - 00000000002FF] Communications Port (COM2) [0000000000003F8 - 00000000003FF] Communications Port (COM1) [000000000000004D0 - 000000000004D1] Programmable interrupt controller [0000000000000680 - 0000000000069F] Motherboard resources [000000000000164E - 00000000000164F] Motherboard resources [0000000000001800 - 0000000000018FE] Motherboard resources [0000000000001854 - 000000000001857] Motherboard resources 🖏 [0000000000003060 - 000000000000307F] Standard SATA AHCI Controller 📷 [0000000000003080 - 000000000003083] Standard SATA AHCI Controller 🖏 [0000000000003090 - 000000000003097] Standard SATA AHCI Controller [000000000000EFA0 - 00000000000EFBF] Intel(R) SMBus Controller - 4B23



5.1.2. Memory Address Map

🗸 🎽 Memory

	[00000000000A0000 - 0000000000BFFFF] PCI Express Root Complex
P	[00000007FC00000 - 000000007FCFFFFF] Intel(R) Ethernet Controller I226-IT
	[00000007FC00000 - 000000007FDFFFF] Intel(R) PCI Express Root Port #6 - 4B3E
	[00000007FC00000 - 00000000BFFFFFFF] PCI Express Root Complex
	[00000007FD00000 - 000000007FD03FFF] Intel(R) Ethernet Controller I226-IT
-	[000000007FE00000 - 000000007FE01FFF] Standard SATA AHCI Controller
	[000000007FE02000 - 000000007FE027FF] Standard SATA AHCI Controller
	[000000007FE03000 - 000000007FE030FF] Standard SATA AHCI Controller
	[0000000C0000000 - 0000000CFFFFFF] Motherboard resources
	[0000000FD000000 - 0000000FD68FFFF] Motherboard resources
	[0000000FD6B0000 - 0000000FD6CFFFF] Motherboard resources
	[0000000FD6F0000 - 0000000FDFFFFFF] Motherboard resources
	[0000000FE000000 - 00000000FE01FFFF] Motherboard resources
	[00000000FE010000 - 00000000FE010FFF] Intel(R) SPI (flash) Controller - 4B24
	[0000000FE032000 - 00000000FE032FFF] Motherboard resources
	[0000000FE033000 - 0000000FE033FFF] Motherboard resources
	[00000000FE200000 - 00000000FE7FFFFF] Motherboard resources
	[00000000FEC80000 - 00000000FECFFFF] Motherboard resources
	[00000000FED00000 - 00000000FED003FF] High precision event timer
	[00000000FED20000 - 00000000FED7FFF] Motherboard resources
<u> </u>	[00000000FED40000 - 00000000FED44FFF] Trusted Platform Module 2.0
	[00000000FED45000 - 00000000FED8FFF] Motherboard resources
	[00000000FED90000 - 00000000FED93FFF] Motherboard resources
1	[0000000FEDA0000 - 0000000FEDA0FFF] Motherboard resources
	[0000000FEDA1000 - 00000000FEDA1FFF] Motherboard resources
	[00000000FEE00000 - 00000000FEEFFFFF] Motherboard resources
	[0000000FF000000 - 0000000FFFFFFF] Motherboard resources
100	[000000400000000 - 000000400FFFFFF] Microsoft Basic Display Adapter
	[000000600000000 - 0000006000FFFFF] Microsoft Basic Display Adapter
Ÿ	[0000006001100000 - 000000600110FFFF] Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
	[0000006001118000 - 00000060011180FF] Intel(R) SMBus Controller - 4B23
	[000000600111B000 - 000000600111BFFF] Intel SD Host Controller
	[0000007FFFEF9000 - 0000007FFFEF9FFF] Intel(R) Serial IO I2C Host Controller - 4B45
	[0000007FFFEFA000 - 0000007FFFEFAFFF] Intel(R) Serial IO I2C Host Controller - 4B44
	[0000007FFFEFB000 - 0000007FFFEFBFFF] Intel(R) Management Engine Interface #1
	[0000007FFFEFC000 - 0000007FFFEFFFF] High Definition Audio Controller
	[0000007FFFF00000 - 0000007FFFFFFFF] High Definition Audio Controller



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5.1.3. IRQ Mapping Chart

System timer
Communications Port (COM2)
Communications Port (COM1)
Microsoft ACPI-Compliant System



6. FAQ

Q 1. Where can I find the serial number of this product?

• The serial number (S/N) is a label printed with alpha-numeric character. You can find the S/N label on the bottom of this product or on its packing box.



Technical Support Form

We deeply appreciate your purchase of Acrosser products. Please find the "**tech_form. doc**" file in our utility CD. If you have any questions or problems about Acrosser products, please fill in the following information. We will answer your questions in the shortest time possible.

Describe Your Info and Acrosser System Info

Your Company Name:	
Your Contact Info:	Phone Number:
Your E-Mail Address:	
Your Company Address:	
Acrosser Model Name:	
Acrosser Serial Number:	
Describe System Configuration	
• CPU Type:	
Memory Size:	
• Storage Device (e.g. HDD, CF, or SSD):	
Additional Peripherals (e.g. Graphic Care	d):
Operating System & Version (e.g. Windo	ws 7 Embedded):
Special API or Driver:	
	(If yes, please provide it for debug.)
Running Applications: Others:	
Describe Your Problems or Questions	:
Send the above information to one of • Acrosser Local Sales Representative	the following Acrosser contacts:
 Acrosser Authorized Sales Channels Acrosser Inquiry http://www.acrosser. Acrosser FAX Number 886-2-299928 	com/inquiry.html 87





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