KIWI310

Intel[®] Celeron[®] N3350 Processor 1.8" Board

User's Manual

USER'S MANUAL



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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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Section 1 Introduction





The KIWI310 is a credit card size board with Intel[®] Celeron[®] N3350 processor that deliver outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions.

The board is equipped with 2GB/4GB LPDDR4 RAM and 32GB/64GB eMMC. It also features one Gigabit/Fast Ethernet, two USB 3.2 Gen1x1 and two USB 2.0 high speed compliant, one M.2 Key E with USB and PCIe (transfer rates up to 5GT/s), and built-in one micro HDMI that can achieve the space required and reliability for industrial applications. Additionally, it provides user with 40-pin General Purpose bus which provides freedom for makers to build up their shield. There are more interfaces available, such as GPIO, UART, I2C, and SPI. And its 1.8" form factor is suitable for an extensive array of PC peripherals. The board can be enhanced by its built-in watchdog timer function, a special industrial feature not commonly seen on other motherboards.

1.1 Features

- Intel[®] Celeron[®] dual core N3350 processor (1.1GHz)
- Solider LPDDR4 supports up to 4GB memory capacity
- 32GB/64GB eMMC
- 2 USB 3.2 Gen1x1 ports and 2 USB 2.0 ports
- 1 Gigabit Ethernet ports
- 1 M.2 Key E for WiFi/BT or AI Movidius
- 40-pin General Purpose bus supported

1.2 Specifications

- CPU
 - Intel[®] Celeron[®] dual core N3350 processor (1.1GHz).
- Thermal Solution
 - Fanless heatsink.
- Operating Temperature
 - 0°C~+60°C

• BIOS

- American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
- 128Mbit SPI Flash, DMI, Plug and Play.
- PXE Ethernet Boot ROM.
- System Memory
 - Onboard LPDDR4 .
 - Maximum up to 4GB LPDDR4 2400MHz memory.
- USB Interface
 - Two USB 3.2 Gen1x1 ports in type A on the rear I/O.
 - Two USB 2.0 ports in type A on the rear I/O.
- Display
 - One 4K/2K micro HDMI.
- Ethernet
 - One 1000/100/10Mbps Gigabit/Fast Ethernet port in RJ-45 connector.
 - Support Wake-on-LAN, PXE Boot ROM with Realtek RTL8111G.

• Storage

- Onboard eMMC up to 64GB.
- Expansion Interface
 - One M.2 2230 Key E.
 - 40-pin General Purpose bus with GPIO, UART, I2C, SPI and PWM included.
- Watchdog Timer
 - 1~255 seconds or minutes; up to 255 levels.

- Power Input
 - One USB type C connector.
 - +9 ~ +20V DC-In @ 3A.
 - Required PD support power adapter or power bank.
 - Auto power on function supported.

• Power Management

ACPI (Advanced Configuration and Power Interface).

- Form Factor
 - 1.8" form factor.



All specifications and images are subject to change without notice.

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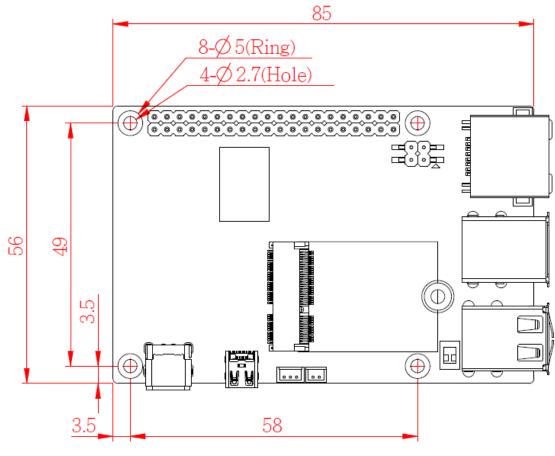
1.3 Utilities

- Chipset and graphics driver
- Ethernet driver
- TXE driver

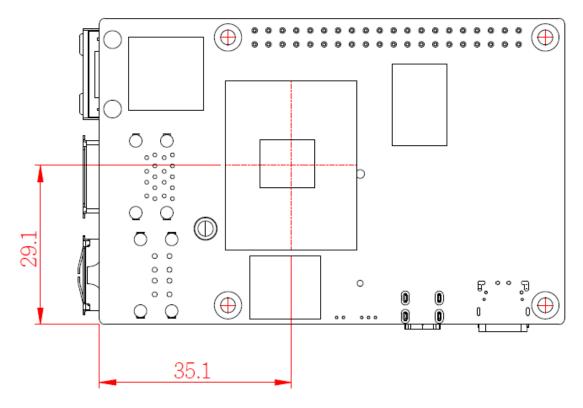
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Section 2 Board and Pin Assignments

2.1 Board Dimensions and Fixing Holes



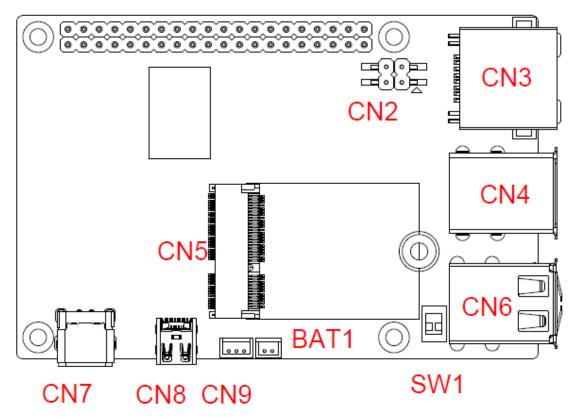
Top View



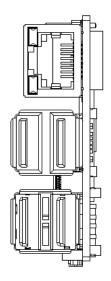
Bottom View

2.2 Board Layout

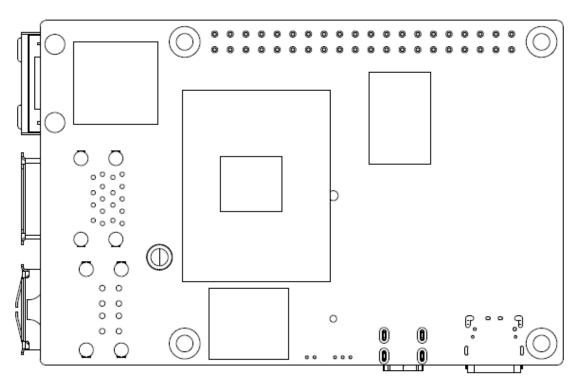
CN1



Top View



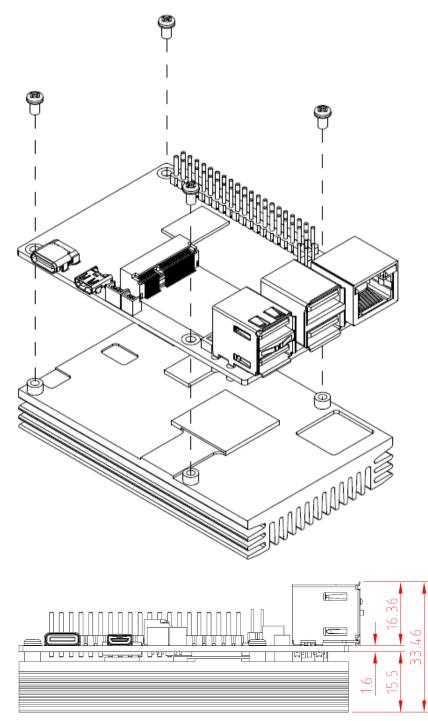
Side View



Bottom View

2.3 Assembly Drawing

For thermal dissipation, a heatsink enables the KIWI310's components to dissipate heat efficiently. All heat generating components are thermally conducted to the heatsink in order to avoid hot spots. Images below illustrate how to install the thermal solution on KIWI310.



2.4 Switch Settings

Properly configure switch setting on the KIWI310 to meet your application purpose. Below you can find a summary table of onboard default settings.

Note	

Once the default switch setting needs to be changed, please do it under power-off condition.

Switch	Description	Setting
SW1	Auto Power On Default: Enable	SW1-1 ON
3001	Restore BIOS Optimal Defaults Default: Normal Operation	SW1-2 OFF

2.4.1 Auto Power On and Restore BIOS Optimal Defaults (SW1)

If dip1 of SW1 (SW1-1) is set to ON position, the system will be automatically power on without pressing soft power button. If set to OFF position, it is necessary to manually press soft power button to power on the system.

The dip2 of SW1 (SW1-2) is for restoring BIOS default status. Flip SW1-2 to ON position for a few seconds then flip it back to OFF position. Doing this procedure can restore BIOS optimal defaults.

Function	Setting
Disable auto power on	SW1-1 OFF
Enable auto power on (Default)	SW1-1 ON
Normal Operation (Default)	SW1-2 OFF
Restore BIOS optimal defaults	SW1-2 ON

2.5 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table of connectors on the hardware.

Connector	Description	
CN1	40-pin GPIO Header	
CN2	POE Header	
CN3	Ethernet Port	
CN4	USB 3.2 Port 1 and 2	
CN5	M.2 2230 Key E Connector	
CN6	USB 2.0 Port 1 and 2	
CN7	Power Connector	
CN8	Micro HDMI Connector	
CN9	Power and Reset Button	
BAT1	CMOS Battery Connector	

2.5.1 40-pin GPIO Header (CN1)

This is a 40-pin (pitch=2.54mm) header.

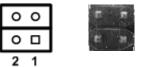
Pin	Signal	Pin	Signal
1	+3.3V level	2	+5V level
3	I2C_SDA/GPIO2	4	+5V level
5	I2C_SCL/GPIO3	6	GND
7	GPIO4	8	UART_TX/GPIO14
9	GND	10	UART_RX/GPIO15
11	GPIO17	12	GPIO18
13	GPIO27	14	GND
15	GPIO22	16	GPIO23
17	+3.3V level	18	GPIO24
19	SPI_MOSI/GPIO10	20	GND
21	SPI_MISO/GPIO9	22	GPIO25
23	SPI_SCK/GPIO11	24	SPI_CS0/GPIO8
25	GND	26	SPI_CS1/GPIO7
27	GPIO0	28	GPIO1
29	GPIO5	30	GND
31	GPIO6	32	PWM0/GPIO12
33	PWM1/GPIO13	34	GND
35	GPIO19	36	GPIO16
37	GPIO26	38	GPIO20
39	GND	40	GPIO21



2.5.2 POE Header (CN2)

The CN2 is a 2x2-pin header (pitch=2.54mm) for connecting to a separate POE HAT interface.

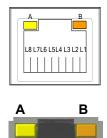
Pin	Signal	Pin	Signal
1	CT2	2	CT1
3	CT4	4	CT3



2.5.3 Ethernet Port (CN3)

Connection can be established by plugging one end of the Ethernet cable into the RJ-45 connector and the other end (phone jack) to a 1000/100/10-Base-T hub.

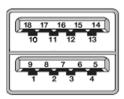
Pin	1000 Base-T	100/10 Base-T	Description	
L1	BI_DA+	TX+	Bidirectional or Transmit Data+	
L2	BI_DA-	TX-	Bidirectional or Transmit Data-	
L3	BI_DB+	RX+	Bidirectional or Receive Data+	
L4	BI_DC+	N.C.	Bidirectional or Not Connected	
L5	BI_DC-	N.C.	Bidirectional or Not Connected	
L6	BI_DB-	RX-	Bidirectional or Receive Data-	
L7	BI_DD+	N.C.	Bidirectional or Not Connected	
L8	BI_DD-	N.C.	Bidirectional or Not Connected	
A	Active Link LED Off: No link Blinking: Data activity detected			
в	Speed LED 1000: Orange 100/10: Green/OFF			



2.5.4 USB 3.2 Port (CN4)

The Universal Serial Bus (compliant with USB 3.2 Gen1x1 (5Gb/s)) connector on the rear I/O is for installing USB peripherals such as keyboard, mouse, scanner, etc.

Pin	Signal	Pin	Signal
1	USB_VCC (+5V_SBY)	10	USB_VCC (+5V_SBY)
2	USB_DN1	11	USB_DN2
3	USB_DP1	12	USB_DP2
4	GND	13	GND
5	SSRX1_N	14	SSRX2_N
6	SSRX1_P	15	SSRX2_P
7	GND	16	GND
8	SSTX1_N	17	SSTX2_N
9	SSTX1_P	18	SSTX2_P

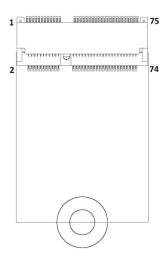




2.5.5 M.2 2230 Key E Connector (CN5)

The CN5 is a M.2 2230 Key E connector. It is suggested to install the M.2 wireless module via PCIe x1 and USB 2.0 with 22mm width and 30mm length.

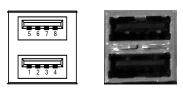
Pin	Signal	Pin	Signal
1	GND	2	+3.3V_SBY
3	USB_DP5	4	+3.3V_SBY
5	USB_DN5	6	N.C.
7	GND	8	N.C.
9	N.C.	10	N.C.
11	N.C.	12	N.C.
13	N.C.	14	N.C.
15	N.C.	16	N.C.
17	N.C.	18	GND
19	N.C.	20	N.C.
21	N.C.	22	N.C.
23	N.C.	24	
25		26	KovE
27	KovE	28	Key E
29	Key E	30	
31		32	N.C.
33	GND	34	N.C.
35	PCIE_TX_P	36	N.C.
37	PCIE_TX_N	38	N.C.
39	GND	40	N.C.
41	PCIE_RX_P	42	N.C.
43	PCIE_RX_N	44	N.C.
45	GND	46	N.C.
47	CLK_PCIE_P	48	N.C.
49	CLK_PCIE_N	50	SUSCLK(+3.3V Level)
51	GND	52	PERST#(+3.3V Level)
53	CLKREQ0#	54	W_DIS2#(+3.3V Level)
55	PEWAKE0#	56	W_DI12#(+3.3V Level)
57	GND	58	N.C.
59	N.C.	60	N.C.
61	N.C.	62	N.C.
63	GND	64	N.C.
65	N.C.	66	N.C.
67	N.C.	68	N.C.
69	GND	70	N.C.
71	N.C.	72	+3.3V_SBY
73	N.C.	74	+3.3V_SBY
75	GND		



2.5.6 USB 2.0 Port (CN6)

The CN6 is a Universal Serial Bus (compliant with USB 2.0 (480Mbps)) connector on the rear I/O. It is commonly used for installing USB peripherals such as keyboard, mouse, scanner, etc.

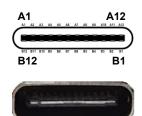
Pin	Signal	Pin	Signal
1	USB VCC (+5V_SBY)	5	USB VCC (+5V_SBY)
2	USB_DN3	6	USB_DN4
3	USB_DP3	7	USB_DP4
4	GND	8	GND



2.5.7 Power Connector (CN7)

The CN7 is a USB type C connector for power input suitable for USB PD type C power adapter or power bank. Power input requirement specifications are 9V/3A or 12V/3A or 15V/3A or 20V/3A.

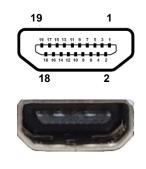
Pin	Signal	Pin	Signal
A1	GND	B1	GND
A2	N.C	B2	N.C
A3	N.C	B3	N.C
A4	VBUS (9V ~ 20V)	B4	VBUS (9V ~ 20V)
A5	CC1	B5	CC2
A6	N.C	B6	N.C
A7	N.C	B7	N.C
A8	N.C	B8	N.C
A9	VBUS (9V ~ 20V)	B9	VBUS (9V ~ 20V)
A10	N.C	B10	N.C
A11	N.C	B11	N.C
A12	GND	B12	GND



2.5.8 Micro HDMI Connector (CN8)

The micro HDMI is a miniaturized type of the High Definition Multimedia Interface specification designed to transmit high-definition video and high-resolution audio over a single cable.

Pin	Signal	Pin	Signal
1	HDMI_HTPLG	2	N.C.
3	HDMI OUT_DATA2+	4	GND
5	HDMI OUT_DATA2-	6	HDMI OUT_DATA1+
7	GND	8	HDMI OUT_DATA1-
9	HDMI OUT_DATA0+	10	GND
11	HDMI OUT_DATA0-	12	HDMI OUT_Clock+
13	GND	14	HDMI OUT_Clock-
15	N.C.	16	GND
17	HDMI OUT_SCL	18	HDMI OUT_SDA
19	+5V		



2.5.9 Power and Reset Button (CN9)

This is a 3-pin (pitch=1.25mm) wafer connector which is compliant with Molex 530470310 for power and reset button interface.

Pin	Signal
1	FP_PSIN_N
2	GND
3	FP_RST_N

000		7	k
	and the second s	н	

2.5.10 CMOS Battery Connector (BAT1)

This is a 2-pin (pitch=1.25mm) wafer connector for CMOS battery interface.

Pin	Signal
1	+3.3V
2	GND



Section 3 Hardware Description

3.1 Microprocessors

The KIWI310 supports Celeron[®] N3350 processor which enables your system to operate under Windows[®] 10 and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

3.2 BIOS

The KIWI310 uses AMI Plug and Play BIOS with a single 128Mbit SPI Flash.

3.3 System Memory

The KIWI310 supports onboard LPDDR4 memory with maximum capacity up to 4GB.

3.4 I/O Port Address Map

✓ Input/output (IO)

	ut/output (IO)
	[00000000000000 - 0000000000006F] PCI Express Root Complex
	[000000000000020 - 000000000000021] Programmable interrupt controller
	[00000000000024 - 000000000000025] Programmable interrupt controller
	[00000000000028 - 000000000000029] Programmable interrupt controller
	[0000000000002C - 00000000000002D] Programmable interrupt controller
	[000000000002E - 0000000000002F] Motherboard resources
	[000000000000030 - 000000000000031] Programmable interrupt controller
t,	[00000000000034 - 000000000000035] Programmable interrupt controller
	[00000000000038 - 000000000000039] Programmable interrupt controller
1	[0000000000003C - 00000000000003D] Programmable interrupt controller
	[00000000000040 - 00000000000043] System timer
Ľ.	[000000000004E - 0000000000004F] Motherboard resources
-	[000000000000050 - 000000000000053] System timer
	[00000000000061 - 00000000000061] Motherboard resources
	[00000000000063 - 00000000000063] Motherboard resources
	[00000000000065 - 00000000000065] Motherboard resources
	[00000000000067 - 00000000000067] Motherboard resources
-	[00000000000070 - 000000000000070] Motherboard resources
	[000000000000070 - 00000000000077] System CMOS/real time clock
b	[00000000000078 - 00000000000CF7] PCI Express Root Complex
	[00000000000080 - 000000000008F] Motherboard resources
t,	[0000000000092 - 00000000000092] Motherboard resources
	[000000000000000 - 000000000000001] Programmable interrupt controller
	[0000000000000A4 - 0000000000000A5] Programmable interrupt controller
	[0000000000000A8 - 0000000000000A9] Programmable interrupt controller
	[000000000000AC - 0000000000000AD] Programmable interrupt controller
	[0000000000000B0 - 000000000000B1] Programmable interrupt controller
b	[000000000000B2 - 000000000000B3] Motherboard resources
	[000000000000B4 - 000000000000B5] Programmable interrupt controller
Ľ.	[000000000000B8 - 0000000000000B9] Programmable interrupt controller
	[000000000000BC - 0000000000000BD] Programmable interrupt controller
	[000000000002F8 - 000000000002FF] Communications Port (COM2)
	[0000000000000400 - 00000000000047F] Motherboard resources
	[0000000000004D0 - 0000000000004D1] Programmable interrupt controller
	[000000000000000 - 0000000000005FE] Motherboard resources
Ŀ	[000000000000000 - 0000000000001F] Motherboard resources
	[00000000000680 - 0000000000069F] Motherboard resources
-	[000000000000000 - 000000000000000 Motherboard resources
	[000000000000A10 - 00000000000A1F] Motherboard resources
	[00000000000A20 - 00000000000A2F] Motherboard resources
10.0	[000000000000000 - 000000000000FFFF] PCI Express Root Complex
۳.,	[00000000000164E - 00000000000164F] Motherboard resources
	[00000000000000000 - 000000000000EFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8
	[00000000000EF00 - 0000000000EFFF] Realtek PCIe GbE Family Controller
	[000000000000000 - 0000000000000603F] Intel(R) HD Graphics 500
	[00000000000000000000000000000000000055] Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
100.1	[0000000000000000000000000000000000000
and a	[0000000000000000000000000000000000000
-	[0000000000000000000000000000000000000

3.5 Interrupt Controller (IRQ) Map

The interrupt controller (IRQ) mapping list is shown as follows:

✓ Ⅲ Interrupt request (IRQ)		tisA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(ISA) 0x00000000 (00)	System timer	(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000005 (05)	Communications Port (COM2)	(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000008 (08)	System CMOS/real time clock	(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
(ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3452	(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
(ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3452	(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
(ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3452	(ISA) 0x00000067 (102)	Microsoft ACPI-Compliant System
(ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3452	(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
(ISA) 0x00000037 (55)	Microsoft ACPI-Compliant System	(ISA) 0x00000069 (104)	Microsoft ACPI-Compliant System
(ISA) 0x00000038 (56)	Microsoft ACPI-Compliant System	(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
(ISA) 0x00000039 (57)	Microsoft ACPI-Compliant System	(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
(ISA) 0x0000003A (58)	Microsoft ACPI-Compliant System	(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
(ISA) 0x0000003B (59)	Microsoft ACPI-Compliant System	(ISA) 0x0000006D (109)	
(ISA) 0x0000003C (60)	Microsoft ACPI-Compliant System	(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
(ISA) 0x0000003D (61)	Microsoft ACPI-Compliant System	(ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
(ISA) 0x0000003E (62)	Microsoft ACPI-Compliant System	(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
(ISA) 0x0000003F (63)	Microsoft ACPI-Compliant System	(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
(ISA) 0x00000040 (64)	Microsoft ACPI-Compliant System	(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
(ISA) 0x00000041 (65)	Microsoft ACPI-Compliant System	(ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
(ISA) 0x00000042 (66)	Microsoft ACPI-Compliant System	(ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
(ISA) 0x00000043 (67)	Microsoft ACPI-Compliant System	(ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
(ISA) 0x00000044 (68)	Microsoft ACPI-Compliant System	(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
(ISA) 0x00000045 (69)	Microsoft ACPI-Compliant System	(ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
(ISA) 0x00000046 (70)	Microsoft ACPI-Compliant System	(ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
(ISA) 0x00000047 (71)	Microsoft ACPI-Compliant System	(ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
(ISA) 0x00000048 (72)	Microsoft ACPI-Compliant System	(ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
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(ISA) 0x0000004B (75)	Microsoft ACPI-Compliant System	ta (ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
Table (ISA) 0x000004C (76)	Microsoft ACPI-Compliant System	to (ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
tox (ISA) 0x000004D (77)	Microsoft ACPI-Compliant System	to (ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
tox (ISA) 0x000004E (78)	Microsoft ACPI-Compliant System	to (ISA) 0x0000080 (128)	Microsoft ACPI-Compliant System
to (ISA) 0x000004F (79)	Microsoft ACPI-Compliant System	to (ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000050 (80)	Microsoft ACPI-Compliant System	tox (ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System	tox (ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System	to (ISA) 0x0000084 (132)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System	tai) (ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
🍋 (ISA) 0x0000054 (84)	Microsoft ACPI-Compliant System	tai (ISA) 0x0000086 (134)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System	ta (ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
🎦 (ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System	ta (ISA) 0x0000088 (136)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System	to (ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System	to (ISA) 0x000008A (138)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System	ta (ISA) 0x000008B (139)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System	to (ISA) 0x000008C (140)	Microsoft ACPI-Compliant System
ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System	ta (ISA) 0x000008D (141)	Microsoft ACPI-Compliant System
to (ISA) 0x000005C (92)	Microsoft ACPI-Compliant System	🏣 (ISA) 0x000008E (142)	Microsoft ACPI-Compliant System
to (ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System	tai (ISA) 0x000008F (143)	Microsoft ACPI-Compliant System
Table (ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System	ta (ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System	E (ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
(ISA) 0x0000060 (96)	Microsoft ACPI-Compliant System	ta (ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
		tion (ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System

tai (ISA) 0x00000094 (148)	Microsoft ACPI-Compliant System	tox000000C7 (199)	Microsoft ACPI-Compliant System
to (ISA) 0x00000095 (149)	Microsoft ACPI-Compliant System	Ten (ISA) 0x000000C8 (200)	Microsoft ACPI-Compliant System
to (ISA) 0x00000096 (150)	Microsoft ACPI-Compliant System	to (ISA) 0x000000C9 (201)	Microsoft ACPI-Compliant System
to (ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System	tox (ISA) 0x000000CA (202)	Microsoft ACPI-Compliant System
Text (ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System	(ISA) 0x000000CB (203)	Microsoft ACPI-Compliant System
to (ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System	(ISA) 0x000000CC (204)	Microsoft ACPI-Compliant System
to (ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System	to (ISA) 0x00000100 (256)	Microsoft ACPI-Compliant System
to (ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System	tox00000101 (257)	Microsoft ACPI-Compliant System
Text (ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System	(ISA) 0x00000102 (258)	Microsoft ACPI-Compliant System
to (ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System	tox00000103 (259)	Microsoft ACPI-Compliant System
to (ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System	to (ISA) 0x00000104 (260)	Microsoft ACPI-Compliant System
to (ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System	to (ISA) 0x00000105 (261)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System	tox (ISA) 0x00000106 (262)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System	tox00000107 (263)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System	to (ISA) 0x00000108 (264)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System	tox00000109 (265)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System	to (ISA) 0x0000010A (266)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System	tox0000010B (267)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System	tox0000010C (268)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System	to (ISA) 0x0000010D (269)	Microsoft ACPI-Compliant System
Tal: (ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System	tox (ISA) 0x0000010E (270)	Microsoft ACPI-Compliant System
to (ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System	(ISA) 0x0000010F (271)	Microsoft ACPI-Compliant System
to (ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System	to (ISA) 0x00000110 (272)	Microsoft ACPI-Compliant System
Ta (ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System	ta (ISA) 0x00000111 (273)	Microsoft ACPI-Compliant System
[ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System	(ISA) 0x00000112 (274)	Microsoft ACPI-Compliant System
tai (ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System	tox (ISA) 0x00000113 (275)	Microsoft ACPI-Compliant System
to (ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System	to (ISA) 0x00000114 (276)	Microsoft ACPI-Compliant System
to (ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System	tox (ISA) 0x00000115 (277)	Microsoft ACPI-Compliant System
Tal: (ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System	tox (ISA) 0x00000116 (278)	Microsoft ACPI-Compliant System
Table (ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System	tox00000117 (279)	Microsoft ACPI-Compliant System
to (ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System	to (ISA) 0x00000118 (280)	Microsoft ACPI-Compliant System
to (ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System	tox00000119 (281)	Microsoft ACPI-Compliant System
to (ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System	tox0000011A (282)	Microsoft ACPI-Compliant System
Tal: (ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System	tox0000011B (283)	Microsoft ACPI-Compliant System
to (ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System	to (ISA) 0x0000011C (284)	Microsoft ACPI-Compliant System
Tan (ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System	(ISA) 0x0000011D (285)	Microsoft ACPI-Compliant System
Tal: (ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System	tox0000011E (286)	Microsoft ACPI-Compliant System
to (ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System	tox0000011F (287)	Microsoft ACPI-Compliant System
Tal: (ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System	ta (ISA) 0x00000120 (288)	Microsoft ACPI-Compliant System
Tan (ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System	tox00000121 (289)	Microsoft ACPI-Compliant System
Tal (ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System	to (ISA) 0x00000122 (290)	Microsoft ACPI-Compliant System
Tal (ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System	(ISA) 0x00000123 (291)	Microsoft ACPI-Compliant System
Tal (ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System	(ISA) 0x00000124 (292)	Microsoft ACPI-Compliant System
ta (ISA) 0x000000BF (191)	Microsoft ACPI-Compliant System	to (ISA) 0x00000125 (293)	Microsoft ACPI-Compliant System
(ISA) 0x000000C0 (192)	Microsoft ACPI-Compliant System	(ISA) 0x00000126 (294)	Microsoft ACPI-Compliant System
(ISA) 0x000000C1 (193)	Microsoft ACPI-Compliant System	(ISA) 0x00000127 (295)	Microsoft ACPI-Compliant System
(ISA) 0x000000C2 (194)	Microsoft ACPI-Compliant System	(ISA) 0x00000128 (296)	Microsoft ACPI-Compliant System
ta (ISA) 0x000000C3 (195)	Microsoft ACPI-Compliant System	(ISA) 0x00000129 (297)	Microsoft ACPI-Compliant System
(ISA) 0x000000C4 (196)	Microsoft ACPI-Compliant System	(ISA) 0x0000012A (298)	Microsoft ACPI-Compliant System
(ISA) 0x000000C5 (197)	Microsoft ACPI-Compliant System	(ISA) 0x0000012B (299)	Microsoft ACPI-Compliant System
to (ISA) 0x000000C6 (198)	Microsoft ACPI-Compliant System	(ISA) 0x0000012C (300)	Microsoft ACPI-Compliant System
	1999 - Maria Mandalan (1999) - Maria Mandalan (1997) - Maria Maria (1997) - Maria (1997) - Maria (1997) - Maria		

tai (ISA) 0x0000012D (301)	Microsoft ACPI-Compliant System	(ISA) 0x00000160 (352)	Microsoft ACPI-Compliant System
to (ISA) 0x0000012E (302)	Microsoft ACPI-Compliant System	(ISA) 0x00000161 (353)	Microsoft ACPI-Compliant System
to (ISA) 0x0000012F (303)	Microsoft ACPI-Compliant System	(ISA) 0x00000162 (354)	Microsoft ACPI-Compliant System
ta (ISA) 0x00000130 (304)	Microsoft ACPI-Compliant System	(ISA) 0x00000163 (355)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000131 (305)	Microsoft ACPI-Compliant System	(ISA) 0x00000164 (356)	Microsoft ACPI-Compliant System
to (ISA) 0x00000132 (306)	Microsoft ACPI-Compliant System	Ta (ISA) 0x00000165 (357)	Microsoft ACPI-Compliant System
to (ISA) 0x00000133 (307)	Microsoft ACPI-Compliant System	(ISA) 0x00000166 (358)	Microsoft ACPI-Compliant System
ta (ISA) 0x00000134 (308)	Microsoft ACPI-Compliant System	(ISA) 0x00000167 (359)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000135 (309)	Microsoft ACPI-Compliant System	(ISA) 0x00000168 (360)	Microsoft ACPI-Compliant System
to (ISA) 0x00000136 (310)	Microsoft ACPI-Compliant System	Ta (ISA) 0x00000169 (361)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000137 (311)	Microsoft ACPI-Compliant System	(ISA) 0x0000016A (362)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000138 (312)	Microsoft ACPI-Compliant System	(ISA) 0x0000016B (363)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x00000139 (313)	Microsoft ACPI-Compliant System	(ISA) 0x0000016C (364)	Microsoft ACPI-Compliant System
to (ISA) 0x0000013A (314)	Microsoft ACPI-Compliant System	(ISA) 0x0000016D (365)	Microsoft ACPI-Compliant System
to (ISA) 0x0000013B (315)	Microsoft ACPI-Compliant System	(ISA) 0x0000016E (366)	Microsoft ACPI-Compliant System
to (ISA) 0x0000013C (316)	Microsoft ACPI-Compliant System	(ISA) 0x0000016F (367)	Microsoft ACPI-Compliant System
ta (ISA) 0x0000013D (317)	Microsoft ACPI-Compliant System	(ISA) 0x00000170 (368)	Microsoft ACPI-Compliant System
tox (ISA) 0x0000013E (318)	Microsoft ACPI-Compliant System	Ta (ISA) 0x00000171 (369)	Microsoft ACPI-Compliant System
tailed (ISA) 0x0000013F (319)	Microsoft ACPI-Compliant System	(ISA) 0x00000172 (370)	Microsoft ACPI-Compliant System
ta (ISA) 0x00000140 (320)	Microsoft ACPI-Compliant System	(ISA) 0x00000173 (371)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000141 (321)	Microsoft ACPI-Compliant System	(ISA) 0x00000174 (372)	Microsoft ACPI-Compliant System
to (ISA) 0x00000142 (322)	Microsoft ACPI-Compliant System	Ta (ISA) 0x00000175 (373)	Microsoft ACPI-Compliant System
to (ISA) 0x00000143 (323)	Microsoft ACPI-Compliant System	(ISA) 0x00000176 (374)	Microsoft ACPI-Compliant System
ta (ISA) 0x00000144 (324)	Microsoft ACPI-Compliant System	(ISA) 0x00000177 (375)	Microsoft ACPI-Compliant System
ta (ISA) 0x00000145 (325)	Microsoft ACPI-Compliant System	(ISA) 0x00000178 (376)	Microsoft ACPI-Compliant System
to (ISA) 0x00000146 (326)	Microsoft ACPI-Compliant System	(ISA) 0x00000179 (377)	Microsoft ACPI-Compliant System
to (ISA) 0x00000147 (327)	Microsoft ACPI-Compliant System	(ISA) 0x0000017A (378)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000148 (328)	Microsoft ACPI-Compliant System	(ISA) 0x0000017B (379)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x00000149 (329)	Microsoft ACPI-Compliant System	(ISA) 0x0000017C (380)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x0000014A (330)	Microsoft ACPI-Compliant System	(ISA) 0x0000017D (381)	Microsoft ACPI-Compliant System
to (ISA) 0x0000014B (331)	Microsoft ACPI-Compliant System	(ISA) 0x0000017E (382)	Microsoft ACPI-Compliant System
tai (ISA) 0x0000014C (332)	Microsoft ACPI-Compliant System	(ISA) 0x0000017F (383)	Microsoft ACPI-Compliant System
tai (ISA) 0x0000014D (333)	Microsoft ACPI-Compliant System	(ISA) 0x00000180 (384)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x0000014E (334)	Microsoft ACPI-Compliant System	(ISA) 0x00000181 (385)	Microsoft ACPI-Compliant System
tai (ISA) 0x0000014F (335)	Microsoft ACPI-Compliant System	(ISA) 0x00000182 (386)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x00000150 (336)	Microsoft ACPI-Compliant System	(ISA) 0x00000183 (387)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000151 (337)	Microsoft ACPI-Compliant System	(ISA) 0x00000184 (388)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x00000152 (338)	Microsoft ACPI-Compliant System	(ISA) 0x00000185 (389)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000153 (339)	Microsoft ACPI-Compliant System	(ISA) 0x00000186 (390)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000154 (340)	Microsoft ACPI-Compliant System	(ISA) 0x00000187 (391)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000155 (341)	Microsoft ACPI-Compliant System	(ISA) 0x00000188 (392)	Microsoft ACPI-Compliant System
to (ISA) 0x00000156 (342)	Microsoft ACPI-Compliant System	(ISA) 0x00000189 (393)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000157 (343)	Microsoft ACPI-Compliant System	(ISA) 0x0000018A (394)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000158 (344)	Microsoft ACPI-Compliant System	(ISA) 0x0000018B (395)	Microsoft ACPI-Compliant System
ta (ISA) 0x00000159 (345)	Microsoft ACPI-Compliant System	(ISA) 0x0000018C (396)	Microsoft ACPI-Compliant System
ta (ISA) 0x0000015A (346)	Microsoft ACPI-Compliant System	(ISA) 0x0000018D (397)	Microsoft ACPI-Compliant System
tox (ISA) 0x0000015B (347)	Microsoft ACPI-Compliant System	(ISA) 0x0000018E (398)	Microsoft ACPI-Compliant System
tai (ISA) 0x0000015C (348)	Microsoft ACPI-Compliant System	ta (ISA) 0x0000018F (399)	Microsoft ACPI-Compliant System
tai (ISA) 0x0000015D (349)	Microsoft ACPI-Compliant System	ta (ISA) 0x00000190 (400)	Microsoft ACPI-Compliant System
to (ISA) 0x0000015E (350)	Microsoft ACPI-Compliant System	ta (ISA) 0x00000191 (401)	Microsoft ACPI-Compliant System
tox0000015F (351)	Microsoft ACPI-Compliant System	to (ISA) 0x00000192 (402)	Microsoft ACPI-Compliant System

tal: (ISA) 0x00000193 (403)	Microsoft ACPI-Compliant System	to (ISA) 0x000001C6 (454)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x00000194 (404)	Microsoft ACPI-Compliant System	to (ISA) 0x000001C7 (455)	Microsoft ACPI-Compliant System
ta (ISA) 0x00000195 (405)	Microsoft ACPI-Compliant System	to (ISA) 0x000001C8 (456)	Microsoft ACPI-Compliant System
tal: (ISA) 0x00000196 (406)	Microsoft ACPI-Compliant System	to (ISA) 0x000001C9 (457)	Microsoft ACPI-Compliant System
tai (ISA) 0x00000197 (407)	Microsoft ACPI-Compliant System	(ISA) 0x000001CA (458)	Microsoft ACPI-Compliant System
tox (ISA) 0x00000198 (408)	Microsoft ACPI-Compliant System	(ISA) 0x000001CB (459)	Microsoft ACPI-Compliant System
ta (ISA) 0x00000199 (409)	Microsoft ACPI-Compliant System	to (ISA) 0x000001CC (460)	Microsoft ACPI-Compliant System
ኪ (ISA) 0x0000019A (410)	Microsoft ACPI-Compliant System	to (ISA) 0x000001CD (461)	Microsoft ACPI-Compliant System
ta (ISA) 0x0000019B (411)	Microsoft ACPI-Compliant System	(ISA) 0x000001CE (462)	Microsoft ACPI-Compliant System
ta (ISA) 0x0000019C (412)	Microsoft ACPI-Compliant System	(ISA) 0x000001CF (463)	Microsoft ACPI-Compliant System
ta (ISA) 0x0000019D (413)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D0 (464)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x0000019E (414)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D1 (465)	Microsoft ACPI-Compliant System
tai (ISA) 0x0000019F (415)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D2 (466)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001A0 (416)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D3 (467)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001A1 (417)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D4 (468)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001A2 (418)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D5 (469)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001A3 (419)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D6 (470)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001A4 (420)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D7 (471)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001A5 (421)	Microsoft ACPI-Compliant System	Tan (ISA) 0x000001D8 (472)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001A6 (422)	Microsoft ACPI-Compliant System	to (ISA) 0x000001D9 (473)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001A7 (423)	Microsoft ACPI-Compliant System	to (ISA) 0x000001DA (474)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001A8 (424)	Microsoft ACPI-Compliant System	Table (ISA) 0x000001DB (475)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001A9 (425)	Microsoft ACPI-Compliant System	Tan (ISA) 0x000001DC (476)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001AA (426)	Microsoft ACPI-Compliant System	La (ISA) 0x000001DD (477)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001AB (427)	Microsoft ACPI-Compliant System	(ISA) 0x000001DE (478)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001AC (428)	Microsoft ACPI-Compliant System	ISA) 0x000001DF (479)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001AD (429)	Microsoft ACPI-Compliant System	Tan (ISA) 0x000001E0 (480)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001AE (430)	Microsoft ACPI-Compliant System	La (ISA) 0x000001E1 (481)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001AF (431)	Microsoft ACPI-Compliant System	ISA) 0x000001E2 (482)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001B0 (432)	Microsoft ACPI-Compliant System	Tan (ISA) 0x000001E3 (483)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001B1 (433)	Microsoft ACPI-Compliant System	Tan (ISA) 0x000001E4 (484)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001B2 (434)	Microsoft ACPI-Compliant System	Tan (ISA) 0x000001E5 (485)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001B3 (435)	Microsoft ACPI-Compliant System	Ta (ISA) 0x000001E6 (486)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001B4 (436)	Microsoft ACPI-Compliant System	ISA) 0x000001E7 (487)	Microsoft ACPI-Compliant System
tai (ISA) 0x000001B5 (437)	Microsoft ACPI-Compliant System	(ISA) 0x000001E8 (488)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001B6 (438)	Microsoft ACPI-Compliant System	(ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001B7 (439)	Microsoft ACPI-Compliant System	Tan (ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001B8 (440)	Microsoft ACPI-Compliant System	ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
tal: (ISA) 0x000001B9 (441)	Microsoft ACPI-Compliant System	(ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001BA (442)	Microsoft ACPI-Compliant System	(ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001BB (443)	Microsoft ACPI-Compliant System	ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
tai (ISA) 0x000001BC (444)	Microsoft ACPI-Compliant System	ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
tail (ISA) 0x000001BD (445)	Microsoft ACPI-Compliant System	(ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001BE (446)	Microsoft ACPI-Compliant System	ta (ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
tai (ISA) 0x000001BF (447)	Microsoft ACPI-Compliant System	(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001C0 (448)	Microsoft ACPI-Compliant System	ta (ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
tailad (ISA) 0x000001C1 (449)	Microsoft ACPI-Compliant System	Ta (ISA) 0x000001F4 (500)	Microsoft ACPI-Compliant System
🏣 (ISA) 0x000001C2 (450)	Microsoft ACPI-Compliant System	(ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
ta (ISA) 0x000001C3 (451)	Microsoft ACPI-Compliant System	(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
to (ISA) 0x000001C4 (452)	Microsoft ACPI-Compliant System	(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
늘 (ISA) 0x000001C5 (453)	Microsoft ACPI-Compliant System	Ta (ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System

to (ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
to (ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
to (ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
to (ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
to (ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
to (ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
(PCI) 0x0000003 (03)	Intel SD Host Controller
E (PCI) 0x00000019 (25)	High Definition Audio Controller
E (PCI) 0x0000001B (27)	Intel(R) Serial IO I2C Host Controller - 5AAC
to (PCI) 0x0000001C (28)	Intel(R) Serial IO I2C Host Controller - 5AAE
E (PCI) 0x0000001D (29)	Intel(R) Serial IO I2C Host Controller - 5AB0
E (PCI) 0x0000001E (30)	Intel(R) Serial IO I2C Host Controller - 5AB2
E (PCI) 0x0000001F (31)	Intel(R) Serial IO I2C Host Controller - 5AB4
to (PCI) 0x00000020 (32)	Intel(R) Serial IO I2C Host Controller - 5AB6
E (PCI) 0x00000021 (33)	Intel(R) Serial IO I2C Host Controller - 5AB8
E (PCI) 0x00000022 (34)	Intel(R) Serial IO I2C Host Controller - 5ABA
(PCI) 0x00000027 (39)	Intel SD Host Controller
(PCI) 0x0000002A (42)	Intel SD Host Controller
(PCI) 0x00000400 (1024)) Intel SD Host Controller
(PCI) 0xFFFFFFF9 (-7)	Intel(R) Trusted Execution Engine Interface
PCI) 0xFFFFFFFA (-6)	Realtek PCIe GbE Family Controller
(PCI) 0xFFFFFFB (-5)	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
(PCI) 0xFFFFFFFC (-4)	Intel(R) HD Graphics 500
The second secon	Standard SATA AHCI Controller
(PCI) 0xFFFFFFFE (-2)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8

3.6 Memory Map

The memory mapping list is shown as follows:

-	mory
	[00000007B800001 - 00000007BFFFFF] PCI Express Root Complex
	[00000007C000001 - 00000007FFFFFF] PCI Express Root Complex
100 1	[00000008000000 - 00000008FFFFFF] Intel(R) HD Graphics 500
-	[000000080000000 - 00000000CFFFFFF] PCI Express Root Complex
-	[00000009000000 - 000000090FFFFF] Intel(R) HD Graphics 500
	[000000091000000 - 0000000910FFFF] High Definition Audio Controller
-	[000000091100000 - 0000000911FFFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD
10	[0000000911FF000 - 0000000911FFFFF] Realtek PCIe GbE Family Controller
-	[000000091200000 - 00000009120FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
	[000000091210000 - 000000091213FFF] High Definition Audio Controller
	[000000091214000 - 000000091215FFF] Standard SATA AHCI Controller
-	[000000091216000 - 0000000912160FF] Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
_	[000000091217000 - 000000091217FFF] Intel SD Host Controller
1.22	[000000091218000 - 000000091218FFF] Intel SD Host Controller
	[000000091219000 - 000000091219FFF] Intel SD Host Controller
_	[00000009121A000 - 00000009121AFFF] Intel SD Host Controller
-	[00000009121B000 - 00000009121BFFF] Intel SD Host Controller
1	[00000009121C000 - 00000009121CFFF] Intel SD Host Controller
	[00000009121D000 - 00000009121DFFF] Intel(R) Serial IO I2C Host Controller - 5ABA
	[00000009121E000 - 00000009121EFFF] Intel(R) Serial IO I2C Host Controller - 5ABA
-	[00000009121F000 - 00000009121FFFF] Intel(R) Serial IO I2C Host Controller - 5AB8
-	[000000091220000 - 000000091220FFF] Intel(R) Serial IO I2C Host Controller - 5AB8
-	[000000091221000 - 000000091221FFF] Intel(R) Serial IO I2C Host Controller - 5AB6
-	[000000091222000 - 000000091222FFF] Intel(R) Serial IO I2C Host Controller - 5AB6
-	[000000091223000 - 000000091223FFF] Intel(R) Serial IO I2C Host Controller - 5AB4
-	[000000091224000 - 000000091224FFF] Intel(R) Serial IO I2C Host Controller - 5AB4
	[000000091225000 - 000000091225FFF] Intel(R) Serial IO I2C Host Controller - 5AB2
	[000000091226000 - 000000091226FFF] Intel(R) Serial IO I2C Host Controller - 5AB2
-	[000000091227000 - 000000091227FFF] Intel(R) Serial IO I2C Host Controller - 5AB0
-	[000000091228000 - 000000091228FFF] Intel(R) Serial IO I2C Host Controller - 5AB0
	[000000091229000 - 000000091229FFF] Intel(R) Serial IO I2C Host Controller - 5AAE
-	[00000009122A000 - 00000009122AFFF] Intel(R) Serial IO I2C Host Controller - 5AAE
	[00000009122B000 - 00000009122BFFF] Intel(R) Serial IO I2C Host Controller - 5AAC
	[00000009122C000 - 00000009122CFFF] Intel(R) Serial IO I2C Host Controller - 5AAC
	[00000009122D000 - 00000009122D7FF] Standard SATA AHCI Controller
-	[00000009122E000 - 00000009122E0FF] Standard SATA AHCI Controller
-	[000000091231000 - 000000091231FFF] Intel(R) Trusted Execution Engine Interface
-	[0000000091300000 - 00000000913FFFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 54
-	[0000000913FC000 - 0000000913FFFFF] Realtek PCIe GbE Family Controller
	[0000000D0C00000 - 0000000D0C00653] Intel(R) Serial IO GPIO Host Controller - INT3452
	[0000000D0C40000 - 0000000D0C40763] Intel(R) Serial IO GPIO Host Controller - INT3452
-	[0000000D0C50000 - 0000000D0C5076B] Intel(R) Serial IO GPIO Host Controller - INT3452
	[0000000D0C70000 - 0000000D0C70673] Intel(R) Serial IO GPIO Host Controller - INT3452
	[0000000E0000000 - 0000000EFFFFFF] Motherboard resources
	[00000000E0000000 - 00000000EFFFFFF] PCI Express Root Complex
	[00000000FEA00000 - 00000000FEAFFFF] Motherboard resources
	[00000000FED00000 - 00000000FED003FF] High precision event timer
	[00000000FED01000 - 00000000FED01FFF] Motherboard resources
	[00000000FED03000 - 00000000FED03FFF] Motherboard resources
	[00000000FED06000 - 00000000FED06FFF] Motherboard resources
	[00000000FED08000 - 00000000FED09FFF] Motherboard resources
-	[00000000FED1C000 - 00000000FED1CFFF] Motherboard resources

Section 4 AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a flash chip to save the setup information whenever the power is turned off. This section provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

- 1. Turn on the computer and press the key immediately.
- 2. After you press the key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

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L			J
	~	• -	

If your computer cannot boot after making and saving system changes with BIOS setup, you can restore BIOS optimal defaults by setting SW1-2 (see section 2.4.1).

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.



Some of the navigation keys differ from one screen to another.

Hot Keys	Description
→← Left/Right	The Left and Right <arrow> keys allow you to select a setup screen.</arrow>
∕↑↓ Up/Down	The Up and Down <arrow> keys allow you to select a setup screen or sub-screen.</arrow>
+– Plus/Minus	The Plus and Minus <arrow> keys allow you to change the field value of a particular setup item.</arrow>
Tab	The <tab> key allows you to select setup fields.</tab>
F1	The <f1> key allows you to display the General Help screen.</f1>
F2	The <f2> key allows you to Load Previous Values.</f2>
F3	The <f3> key allows you to Load Optimized Defaults.</f3>
F4	The <f4> key allows you to save any changes you have made and exit Setup. Press the <f4> key to save your changes.</f4></f4>
Esc	The <esc> key allows you to discard any changes you have made and exit the Setup. Press the <esc> key to exit the setup without saving your changes.</esc></esc>
Enter	The <enter> key allows you to display or change the setup option listed for a particular setup item. The <enter> key can also allow you to display the setup sub- screens.</enter></enter>

4.3 Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.

Main Advanced Chipset	tility - Copyright (C) 2021 Americar Security Boot Save & Exit	n Megatrends, Inc.
BIOS Information Project Version Build Date and Time System Date System Time Access Level	KIWI310 X008 05/31/2021 15:58:46 [Mon 05/31/2021] [21:45:26] Administrator	Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 2005-2099 Months: 1-12 Days: dependent on month
	.1263. Copyright (C) 2021 American	<pre>→+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

BIOS Information

Display BIOS firmware information.

• System Date/Time

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Access Level

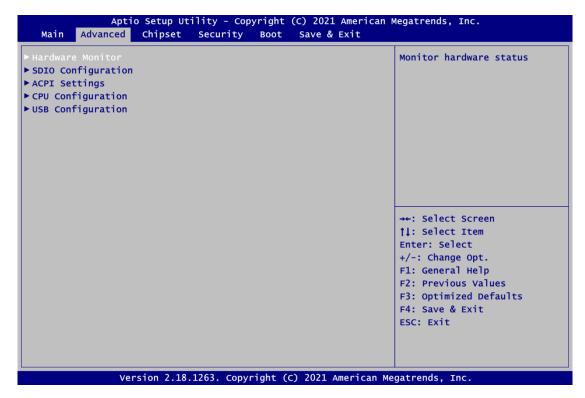
Display the access level of current user.

4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- Hardware Monitor
- SDIO Configuration
- ► ACPI Settings
- CPU Configuration
- USB Configuration

For items marked with "▶", please press <Enter> for more options.



• Hardware Monitor

This screen monitors hardware health status.

Aptio Setup U Advanced	tility - Copyright (C) 2021 Ame	rican Megatrends, Inc.
PC Health Status		
CPU DTS Temperature System Temperature +VBAT +5V	: +55 °C : +44 °C : +3.024 V : +4.989 V	
		<pre> ++: Select Screen \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$</pre>
Version 2.18	.1263. Copyright (C) 2021 Amer	ican Megatrends, Inc.

This screen displays the temperature of system and CPU, system voltages (+VBAT and +5V).

• SDIO Configuration

You can use this screen to select options for the SDIO (Secure Digital Input/Output) configuration.

Aptio Setup Utility - Copyright (C) 2021 America Advanced	an Megatrends, Inc.
SDIO Configuration	▲ Mass storage device emulation type. 'AUTO' enumerates
Mass Storage Devices:	devices less than 530MB as
Sdio Device 1 Details:	floppies. Forced FDD option can be used to force HDD formatted drive to boot as FDD.
Bus 0 Dev 1c Func 0 MMC - DA6016(15.7GB) [Auto]	formatied drive to boot as PDD.
MMC - DA6016(15.7GB)	<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>
Version 2.18.1263. Copyright (C) 2021 American	Megatrends, Inc.

• ACPI Settings

You can use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

Aptio Setup Advanced	Utility - Copyright (C) 2021 Americar	n Megatrends, Inc.
ACPI Settings		Select the highest ACPI sleep state the system will enter
ACPI Sleep State		when the SUSPEND button is pressed.
	ACPI Sleep State Suspend Disabled S3 (Suspend to RAM)	
		<pre>++: Select Screen 11: Select Item</pre>
		Enter: Select
		+/-: Change Opt.
		F1: General Help F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2.3	18.1263. Copyright (C) 2021 American	Megatrends, Inc.

ACPI Sleep State

Select the ACPI (Advanced Configuration and Power Interface) sleep state. Configuration options are Suspend Disabled and S3 (Suspend to RAM). The S3 (Suspend to RAM) option selects ACPI sleep state the system will enter when suspend button is pressed.

• CPU Configuration

This screen shows the CPU Configuration and you can change the value of the selected option.

CPU Configuration		When enabled, a VMM can
Intel(R) Celeron(R) CPU N3350 @ 1	10687	
CPU Signature	506CA	hardware capabilities provide
Microcode Patch	1E	by Vanderpool Technology
Max CPU Speed	1100 MHz	
Min CPU Speed	800 MHz	
Processor Cores	2	
Intel HT Technology	Not Supported	
Intel VT-x Technology	Supported	
64-bit	— Intel Virtualization Te	chnology —
of bit		
L1 Data Cache	Disabled	
L1 Code Cache	Enabled	
L2 Cache		elect Screen
L3 Cache	Not Present	elect Item
	Hot IT count	Enter: Select
	[Enabled]	+/-: Change Opt.
Turbo Mode	[Disab]ed]	F1: General Help
	[stonston]	F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Intel Virtualization Technology

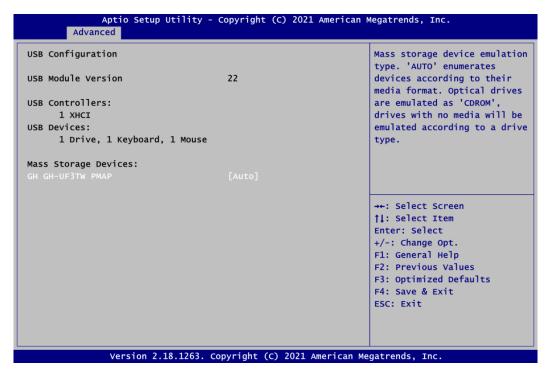
Enable or disable Intel[®] Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a computer system to work as several virtual systems.

Turbo Mode

Enable or disable Intel[®] turbo boost mode allowing processor cores to run faster but not exceed CPU defined frequency limits.

Advanced	
CPU Configuration	
Intel(R) Celeron(R) CPU N	13350 @ 1.10GHz
CPU Signature	506CA
Microcode Patch	1E
Max CPU Speed	1100 MHz
Min CPU Speed	800 MHz
Processor Cores	2
Intel HT Technology	Not Supported
Intel VT-x Technology	Supported
64-bit	Turbo Mode
	Disabled
L1 Data Cache	Enabled
L1 Code Cache	
L2 Cache L3 Cache	Net Dresent
Lo Cache	Not Present
Intel Virtualization Tech	nology [Enabled]
Turbo Mode	[Disabled]
	[bisabica]

• USB Configuration



USB Devices

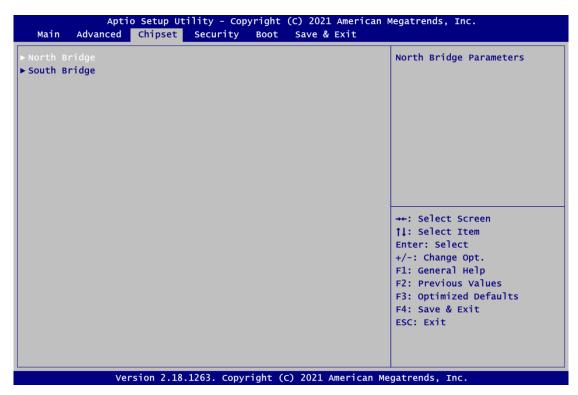
Display all detected USB devices.

4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- North Bridge
- South Bridge

For items marked with "▶", please press <Enter> for more options.



• North Bridge

t	
2048 MB (LPDDR4)	
1024 MB (LPDDR4) 1024 MB (LPDDR4)	
	<pre>→+: Select Screen ↑↓: Select Item Enter: Select</pre>
	+/-: Change Opt. F1: General Help F2: Previous Values
	F3: Optimized Defaults F4: Save & Exit ESC: Exit
	1024 MB (LPDDR4)

Memory Information Display system memory information.

• South Bridge This screen shows Intel[®] MRC/PMC/TXE FW version.

	tup Utility - Copyright (C) 2021 Amer <mark>ipset</mark>	rican Megatrends, Inc.
TXE Information		Enable or Disable the Wake on Lan.
MRC Version PMC FW TXE FW	0.56 03.21 3.1.76.2356	
Wake On Lan	[Enable]	
	Wake On Lan Disable Enable	
		<pre>++: Select Screen \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$</pre>
		+/-: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version	1 2.18.1263. Copyright (C) 2021 Americ	can Megatrends, Inc.

Wake on LAN

Enable or disable integrated LAN to wake the system.

4.6 Security Menu

The Security menu allows users to change the security settings for the system.

Aptio Setup Utility Main Advanced Chipset <mark>Secu</mark> r	- Copyright (C) 2021 American	Megatrends, Inc.
Password Description If ONLY the Administrator's passwo then this only limits access to Se only asked for when entering Setup If ONLY the User's password is set is a power on password and must be boot or enter Setup. In Setup the have Administrator rights. The password length must be in the following range: Minimum length	tup and is , then this entered to	Set Setup Administrator Password
Maximum length Setup Administrator Password User Password ► Secure Boot	20 Copyright (C) 2021 American M	<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>

- Setup Administrator Password Set setup administrator password.
- User Password Set user password.
- Secure Boot Use this item to set parameters related to Secure Boot.

• Secure Boot

The Secure Boot feature is designed to ensure and protect the system from unauthorized access and malwares during boot-up.

System Mode	Setup	Secure Boot activated when:
Vendor Keys	Not Modified	Secure Boot is enabled Platform Key(PK) is enrolled
		System mode is User/Deployed
	Not Active	and CSM is disabled
Secure Boot Customization	[Custom]	
Restore Factory Keys		
Reset To Setup Mode		
Key Management		
		→+: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Secure Boot

Secure Boot activated when Platform Key (PK) is enrolled, system mode is user/deployed and CSM is disabled.

Secure Boot Customization

- Standard: Allow the system to automatically load the Secure Boot keys from the BIOS databases.
- Custom: Allow you to customize the Secure Boot settings and manually load its keys from the BIOS database.

Restore Factory Keys

Force System to User mode. Install factory default Secure Boot key databases.

Reset To Setup Mode

Delete all Secure Boot key databases from NVRAM.

Key Management

Use this item for configuration of advanced items.

Key Management

Aptio Setup U	tility - Copyright (C) 2021 American Security	Megatrends, Inc.
Factory Key Provision > Restore Factory Keys > Reset To Setup Mode > Export Secure Boot variables > Enroll Efi Image Device Guard Ready > Remove 'UEFI CA' from DB > Restore DB defaults	[Disabled]	Provision factory default keys on next re-boot only when System in Setup Mode
<pre>▶ Key Exchange Keys 0 ▶ Authorized Signatures 0 ▶ Forbidden Signatures 0</pre>	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
Version 2.18	.1263. Copyright (C) 2021 American M	egatrends, Inc.

Factory Key Provision

Enable or disable provision factory default keys on next reboot only when System in Setup mode.

Restore Factory Keys

Force System to User mode. Install factory default Secure Boot key databases.

Reset To Setup Mode

Delete all Secure Boot key databases from NVRAM.

Export Secure Boot Variables

Export all Secure Boot variables to the files in a root folder on a file system device.

Enroll Efi Image

Allow the image to run in Secure Boot mode. Enroll SHA256 hash certificate of a PE image into Authorized Signature Database (DB).

Remove 'UEFI CA' from DB

Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (DB).

Restore DB defaults

Restore DB variable to factory defaults.

4.7 Boot Menu

The Boot menu allows users to change boot options of the system.

	ty - Copyright (C) 2021 American	Megatrends, Inc.
MainAdvancedChipsetSBootConfigurationSetupPromptTimeoutBootupNumlockStateQuietBootLaunchUEFIPXEOpROMpolicy	ecurity Boot Save & Exit 1 [On] [Disabled] [Disabled]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Boot Mode Boot Option Priorities Boot Option #1	[UEFI Mode] [Windows Boot Manage]	
Boot Option #2	[UEFI: GH GH-UF3TW P]	<pre>++: Select Screen \$ 1\$: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2 18 12	63. Copyright (C) 2021 American M	egatrends Inc

- Setup Prompt Timeout Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
- **Bootup Numlock State** Use this item to select the power-on state for the keyboard NumLock.
- Quiet Boot Select to display either POST output messages or a splash screen during boot-up.
- Launch UEFI PXE OpROM policy Control the execution of UEFI PXE OpROM.

Boot Mode •

Use this item for boot mode settings. - UEFI Mode: Select support to boot any UEFI-capable OS.

Main	Advanced	Chipset	Security	Boot	Save & Exit
Boot Co	nfiguration				
	rompt Timeo Numlock Sta		1 [On]	
Quiet B Launch	oot UEFI PXE Op	ROM policy	-	Disable Disable	-
					de]
Boot Op Boot Op Boot Op		ties		UEFI Me Legacy	

Legacy Mode: Select support to boot non UEFI-capable OS that expects a legacy -BIOS interface.

Main	Advanced	Chipset	Security	Boot	Save & Exit
Boot Co	nfiguration				
	rompt Timeo Numlock Sta		1 [0)n]	
Quiet B Launch	oot PXE OpROM p		-	isable Disable	· · ·
Boot Mo	de		[1	egacy	Mode]
Boot Option Priorities Boot Option #1 Boot Option #2		Launch PXE OpROM policy Disabled Enabled			

Boot Option Priorities •

These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.

Aptio Setup Utility - Copyright (C) 202 Main Advanced Chipset Security Boot <mark>Save</mark>	l American Megatrends, Inc. & Exit
Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes	Exit system setup after saving the changes.
Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Override UEFI: GH GH-UF3TW PMAP, Partition 1 Windows Boot Manager (MMC - DA6016)	<pre>→+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263. Copyright (C) 2021	American Megatrends. Inc.

Save Changes and Exit

When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

• Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

• Save Changes and Reset

When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

• Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

• Save Changes

When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

• Discard Changes

Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

• Restore Defaults

It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

• Save as User Defaults

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

• Restore User Defaults

It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

Boot Override

Select a drive to immediately boot that device regardless of the current boot order.

Appendix A Watchdog Timer

A.1 About Watchdog Timer

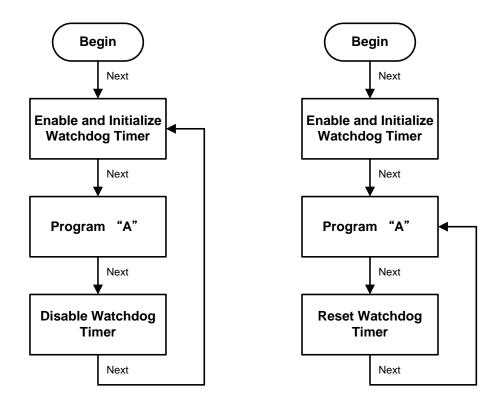
Software stability is major issue in most application. Some embedded systems are not watched by operator for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will rebot.

A.2 How to Use Watchdog Timer

The I/O port base addresses of watchdog timer are 2E (hex) and 2F (hex). The 2E (hex) and 2F (hex) are address and data port respectively.

Assume that program A is put in a loop that must execute at least once every 10ms. Initialize watchdog timer with a value bigger than 10ms. If the software has no problems; watchdog timer will never expire because software will always restart the counter before it reaches zero.



A.3 Sample Program

Assembly sample code :

;Enable WDT: mov dx,2Eh ;Un-lock super I/O mov al,87 out dx,al out dx,al ;Select Logic device: dx,2Eh al,07h mov mov dx,al dx,2Fh out mov al,07h mov dx,al out ;Enable WDT base address: dx,2Eh mov mov al,30h out dx,al dx,2Fh al,01h mov moν dx,al out ;Activate WDT: dx,2Eh al,0F0h mov mov out dx,al dx,2Fh a1,80h mov mov dx,al out ;Set base timer : dx,2Eh al,0F6h dx,al mov mov out mov dx,2Fh ;M=00h,01h,...FFh (hex),Value=0 to 255 al,Mh mov ;(see **Note** below) dx,al out ;Set Second or Minute : dx,2Eh al,0F5h mov mov out dx,al dx,2Fh mov ;N=F1h or F9h(see Mote below) al,Nh mov out dx,al

Note:

If **N**=F1h, the time base is set to second. **M** = time value 00: Time-out disable 01: Time-out occurs after 1 second 02: Time-out occurs after 2 seconds 03: Time-out occurs after 3 seconds

FFh: Time-out occurs after 255 seconds

If **N**=F9h, the time base is set to minute. **M** = time value 00: Time-out disable 01: Time-out occurs after 1 minute 02: Time-out occurs after 2 minutes 03: Time-out occurs after 3 minutes

FFh: Time-out occurs after 255 minutes