MITX-KL10 Motherboard

User Manual

Chapter 1 Product Introduction

1.1 Main Information

KL10 motherboard is based on Intel KabyLake-U (SkyLake-U optional) processors.

1.2 Specification

KabyLake-U processor:

i7-7500U, dual ore, 2.7GHz, supports turbo frequency and EIST technology,

i5-7200U, dual core, 2.5GHz, supports turbo frequency and EIST technology,

i3-7100U, dual core, supports EIST technology,

Celeron 3865U, dual core, 1.8GHz, supports EIST technology.

SkyLake-U processor:

i7-6500U, dual core, 2.5GHz, supports turbo frequency and EIST technology,

i5-6200U, dual core, 2.3GHz, supports turbo frequency and EIST technology,

i3-6100U, dual core, 2.3GHz, supporting EIST technology,

Celeron 3855U, dual core, 1.6GHz, supports EIST technology.

Memory: 2 x SO-DIMM DDR4 up to 32GB.

GPU: Integrated, 1 x HDMI, 1 x DP, 1 x LVDS (eDP optional), DP to HDMI converter optional.

Storage: 1 x M.2 Key B (for 2242 SSD), 2 x SATA3.0 at most, 1 x eMMC (optional).

USB: 4 x USB3.0, 4 x USB2.0.

Ethernet: 2 x LAN (intel i211).

Audio: Onboard High resolution audio chip, supports Speaker_out, MIC_in, SPDIF and amplifier.

I/O: 5 x RS232, 1 x RS485, 1 x LPT(header), a set of PS/2 (KB/MS header).

Others: 1 x M.2 Key B (supports NGFF 3G/4G module),

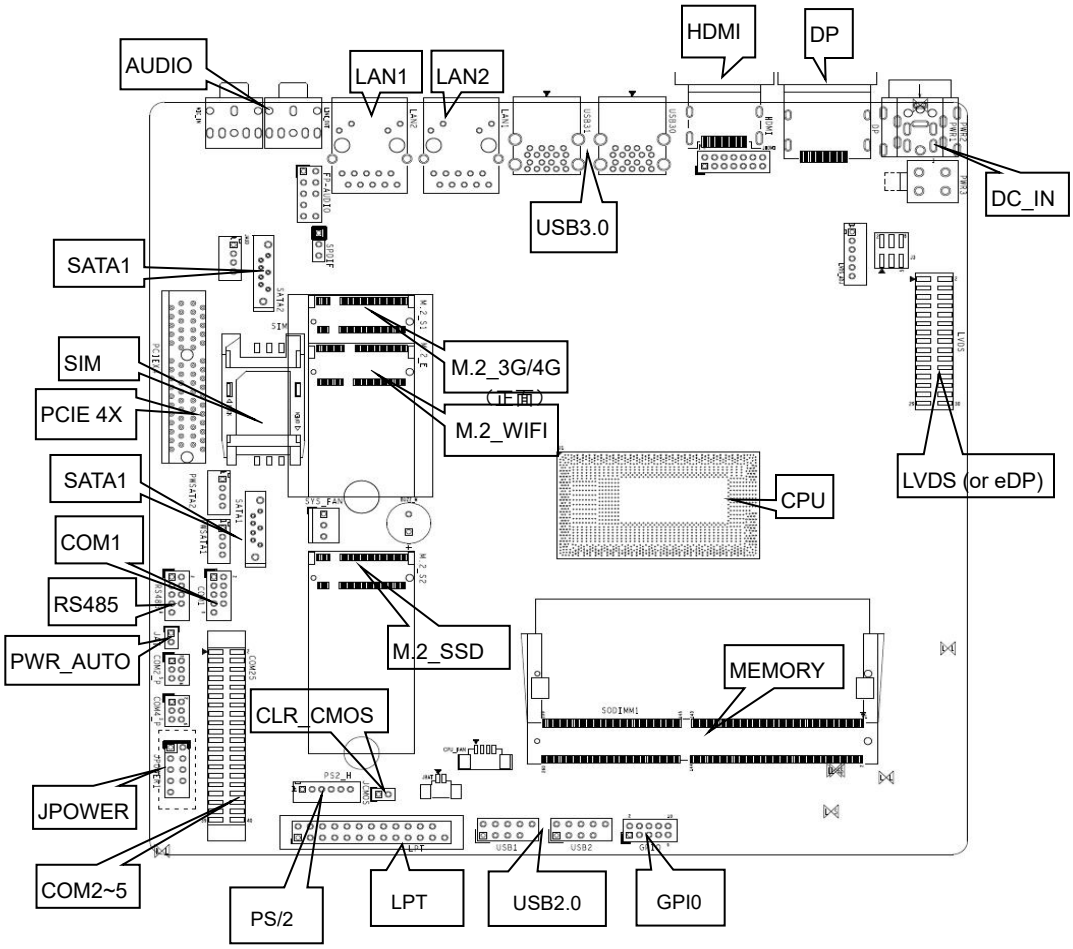
1 x M.2 Key E (supports NGFF WIFI), 1 x PCIE 4X, 8 x GPIO.

Size: 170mm x 170mm.

Power: 12V DC_IN adapter.

Operating Temperature: -40℃-60℃

1.3 Diagram



Chapter 2 Hardware

2.1 Jumper Setting

Set jumpers according to your needs before installing hardware.

Tips about how to identify the first header of jumpers and interfaces: 1. Observe the mark beside plugs, the first header is usually marked by “1” or bold line or triangular symbol; 2. The first header is the square pad of pads on the back.

2.2 System Memory

Onboard 2 x SO-DIMM DDR4-2133 slots up to 32GB memory, supports dual channel.

2.3 Display Interfaces

1 x HDMI1.4 and header is reserved as an alternative (cannot connect both at the same time to the screen), 1 x DP1.2, 1 x LVDS (eDP1.3 optional), supports trio independent display and 4K HD display.

2.4 LVDS (Silk-print: LVDS, LVDS_ADJ, J3)

Dual channel 24bit LVDS. The power of LVDS screen cable is controlled by J3, and the backlight power is controlled by LVDS_ADJ .

LVDS:

Signal	Pin		Signal
VCC	1	2	VCC
VCC	3	4	GND
GND	5	6	GND
A_DATA0_DN	7	8	A_DATA0_DP
A_DATA1_DN	9	10	A_DATA1_DP
A_DATA2_DN	11	12	A_DATA2_DP
GND	13	14	GND

A_CLK_DN	15	16	A_CLK_DP
A_DATA3_DN	17	18	A_DATA3_DP
B_DATA0_DN	19	20	B_DATA0_DP
B_DATA1_DN	21	22	B_DATA1_DP
B_DATA2_DN	23	24	B_DATA2_DP
GND	25	26	GND
B_CLK_DN	27	28	B_CLK_DP
B_DATA3_DN	29	30	B_DATA3_DP

LVDS_ADJ:

Pin	Signal
1	12V
2	12V
3	LCD_BKL_ON
4	LCD_BKL_ADJ
5	GND
6	GND

J3 (screen power jumper):

Interface	Setting	Function
1-2	Close	VCC(+3.3V)
3-4	Close	VCC(+5V)
5-6	Close	VCC(+12V)

Attention: LVDS screen's power can be adjusted among 12V/5V/3.3V via jumper setting. Connecting 2 or more interfaces via jumper cap at the same time is strictly forbidden.

2.5 eDP (Silk-print: LVDS, LVDS_ADJ, J3)

This interface is optional, supporting 2 LANE eDP1.3. When this interface is set as eDP, LVDS does not work. The power of screen is controlled by J3 jumper, and the backliilght power is controlled by LVDS_ADJ.

eDP header (Silk-print: LVDS):

Signal	Pin		Signal
VCC	1	2	VCC
VCC	3	4	EDP_HPD
GND	5	6	GND
EDP_AUXN	7	8	EDP_AUXP
N/A	9	10	N/A
EDP_DATA0_P	11	12	EDP_DATA0_N
GND	13	14	GND
N/A	15	16	N/A
EDP_DATA1_P	17	18	EDP_DATA1_N
N/A	19	20	N/A
N/A	21	22	N/A
N/A	23	24	N/A
GND	25	26	GND
N/A	27	28	N/A
N/A	29	30	N/A

eDP backlight header (Silk-print: LVDS_ADJ):

Pin	Signal
1	12V
2	12V
3	LCD_BKL_ON
4	LCD_BKL_ADJ

5	GND
6	GND

eDP voltage header (Silk-print: J3):

Interface	Setting	Function
1-2	Close	VCC(+3.3V)
3-4	Close	VCC(+5V)
5-6	Close	VCC(+12V)

Attention: eDP screen's power can be adjusted among 12V/5V/3.3V via jumper setting. Connecting 2 or more interfaces via jumper cap at the same time is strictly forbidden.

2.6 HDMI Header (Silk-print: JHDMI)

HDMI header is reserved (optional). As an alternative, HDMI port and header cannot be connected to the screen at the same time.

JHDMI:

Signal	Pin		Signal
DVI1_DATA2_P	1	2	DVI1_DATA2_N
DVI1_DATA1_P	3	4	DVI1_DATA1_N
DVI1_DATA0_P	5	6	DVI1_DATA0_N
DVI1_CLK_P	7	8	DVI1_CLK_N
DVI1_SCL	9	10	DVI1_SDA
VGA_DATA_5V	11	12	GND
DVI1_DETECT	13	14	GND

2.7 Expansion Slots (Silk-print: M.2_S1, M.2_E, PCIEX4)

M.2_S1: M.2 Key B for NGFF 3G/4G module, SIM slot onboard.

M.2_E: M.2 Key E for NGFF WIFI.

PCIEX4: PCIE3.0/4X for wifi card, display card or other PCIE devices.

2.8 eMMC (Silk-print: U8)

eMMC interface is optional and its capacity is also optional.

2.9 Storage Interface (Silk-print: SATA1, SATA2, M.2_S2)

2 x SATA3.0 interfaces at most and the speed is up to 6Gb/s. 2 x SATA power sockets onboard. only 1 SATA3.0 is supported if Celeron processor is onboard. M.2_S2 is M.2 Key B for 2242 SSD.

2.10 USB (Silk-print: USB1, USB2)

4 x USB3.0 interfaces and 4 x USB2.0 by header.

USB1, USB2:

Signal	Pin		Signal
VCC 5V	1	2	VCC 5V
USB DATA-	3	4	USB DATA-
USB DATA+	5	6	USB DATA+
GND	7	8	GND
(NC)	9	10	N/A

2.11 LAN

High-performance gigabit ethernet control Intel i211 chip, 2 x RJ45 interfaces, supports Magic packet wake-up and PXE.

LED indicator light:

LILED (orange)	Function	ACTLED(green)	Function
On	Connected	Flicker	Data transmission

2.12 Audio Interface (Silk-print: FP_AUDIO, JAUD, SPDIF)

ALC662 audio control chip. The green one is Speaker-out, and the pink one is Mic-in.JAUD is amplifier output, and SPDIF header is SPDIF-out.

FP_AUDIO:

Signal	Pin		Signal
MIC2-L	1	2	AGND
MIC2-R	3	4	AVCC
FRO-R	5	6	MIC2-JD
F-IO-SEN(AGNG)	7	8	（NC）
FRO-L	9	10	LIN2-JD

JAUD:

Pin	Signal
1	L+
2	L-
3	R-
4	R+

SPDIF:

Pin	Signal

1	+5V
2	SPDIF Out
3	GND

2.13 COM (Silk-print: COM1, COM25, RS485, JCOM2_P, JCOM4_P)

6 x COM (internal header 2.0mm distance). COM1 is industrial definition. COM1, COM2, COM3, COM4 and COM5 is RS232, and COM6 is RS485. COM2_P and COM4_P provides 5V/12V (optional) voltage for COM2 and COM4.

COM1:

Signal	Pin		Signal
DCD#	1	2	DSR#
RXD	3	4	RTS#
TXD	5	6	CTS#
DTR#	7	8	RI#
GND	9	10	(NC)

COM25:

Signal	Pin		Signal
DCD#	1	2	RXD
TXD	3	4	DTR#
GND	5	6	DSR#
RTS#	7	8	CTS#
RI#	9	10	N/A
DCD#	11	12	RXD
TXD	13	14	DTR#
GND	15	16	DSR#
RTS#	17	18	CTS#

RI#	19	20	N/A
DCD#	21	22	RXD
TXD	23	24	DTR#
GND	25	26	DSR#
RTS#	27	28	CTS#
RI#	29	30	N/A
DCD#	31	32	RXD
TXD	33	34	DTR#
GND	35	36	DSR#
RTS#	37	38	CTS#
RI#	39	40	N/A

RS485:

Signal	Pin		Signal
DATA-	1	2	N/A
DATA+	3	4	N/A
N/A	5	6	N/A
N/A	7	8	N/A
GND	9	10	(NC)

COM2_P, COM4_P:

Interface	Setting	Function
1-2	Close	5V
3-4	Close	RI
5-6	Close	12V

2.14 LPT (Silk-print: LPT)

Onboard 1 x 2X13PIN LPT interface. Pallets are needed for practical use. Customers can connect it to equipment like printer.

LPT:

Signal	Pin		Signal
STB	1	2	AFD
LPT_ PPD0	3	4	ERROR
LPT_ PPD1	5	6	INIT
LPT_ PPD2	7	8	SLIN
LPT_ PPD3	9	10	GND
LPT_ PPD4	11	12	GND
LPT_ PPD5	13	14	GND
LPT_ PPD6	15	16	GND
LPT_ PPD7	17	18	GND
ACK	19	20	GND
BUSY	21	22	GND
PE	23	24	GND
SLCT	25	26	（NC）

2.15 GPIO (Silk-print: GPIO)

Onboard 2×5Pin JGPIO header (2.0mm distance), 8 x GPIO input and output.

Signal	Pin		Signal
PCH_GPP_C16 5_0	1	2	3.3V
PCH_GPP_C17	3	4	PCH_GPP_A18
PCH_GPP_C18	5	6	PCH_GPP_A19

PCH_GPP_C19	7	8	PCH_GPP_A20
GND	9	10	PCH_GPP_A21

2.16 PS/2 (Silk-print: PS2_H)

Onboard 6 pin PS/2.

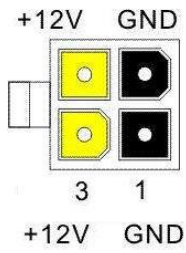
Pin	Signal
1	+5V
2	KB_DATA
3	KB_CLK
4	MS_ DATA
5	MS_CLK
6	GND

2.17 Motherboard power (Silk-print: PWR1, PWR3)

12V DC_IN adapter or ATX12V (2x2PIN) power.

PWR1: 12V DC_IN adapter jack.

PWR3： ATX12V (2x2PIN) power interface.



2.18 Switch Panel Header (Silk-print: JPOWER1)

Front panel interface is to connect function buttons and indicator lights on the case.

JPOWER1:

Signal	Pin		Signal
HDD_LED+	1	2	PWR_LED+
HDD_LED-	3	4	PWR_LED-
RSTBTN+	5	6	PWR_ON+
RSTBTN-	7	8	PWR_ON-
N/A	9	10	(NC)

2.19 Auto Power On (Silk-print: JAT)

JAT:

Setting	JAT
Close	Auto power on

Attention: This function shares some similarity with “Restore AC Power Loss” in BIOS, and if the latter is set to be “Power on”, this function will automatically work.

2.20 CMOS (Silk-print: JCMOS)

CMOS is powered by the button battery on the board. Clearing CMOS will permanently clear previous system setting and restore it to factory setting.

Steps: 1. Turn off the computer and disconnect power,

2. Connect the jumper cap to the 1ST and 2nd pin of JCMOS pin for 10 seco, and disconnect,

3. Turn on the computer, and press <Del> to enter BIOS setting, overload

the best default value,

4. Save and exit.

JCOMS:

Setting	JCMOS
Close	Clear CMOS content

⚠ Don't clear COMS when the computer is connected to power so as to avoid damage to the board.