VEX2-6427

with
DM&P Vortex86EX2
600MHz processor

Version 2.0

March 2020

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Revision History

Revision	Date	Remark
1.0	July, 2019	First version release
2.0	March, 2020	Second version release

Table of Contents

1 General Information

1.1   Overview

The Vortex86EX2 series is the new generation heterogeneous two-core CPU which utilizes the Master and Slave cores to simultaneously run two different BIOSs & Operating Systems without affecting each other; equipped with various programmable I/O; it's designed for real-time desired industrial/automation applications.

Perfect Replacement Solution for Vortex86DX Platform.
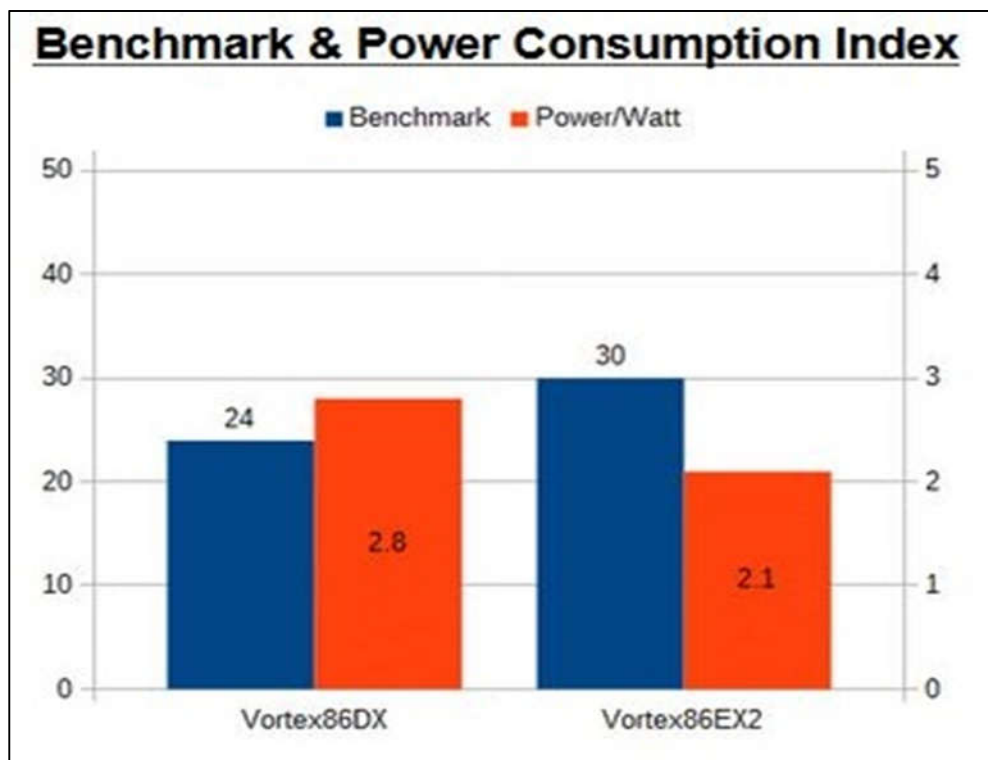
1. CPU instruction upgrade
2. DRAM from DDR2 to DDR3
3. Manufacturing process from 90nm to 65nm

VEX2-6427 is a solution of 3.5'' based on VEX2-DIP168 CPU module, which has lower power consumption and multiple I/O selections.

Features of VEX2-6427:

- DM&P SoC Vortex86EX2 - 600 MHz

- 512MB/1GB DDR3 onboard

- 10S/4U/VGA/LCD/LVDS/LAN/2CAN/I²C/Audio/MINIPCIE

- Operation Temperature: -20 ~ +70°C / -40 ~ +85°C (Option)

1.2   Block diagram

Vortex86EX2 DIP-168
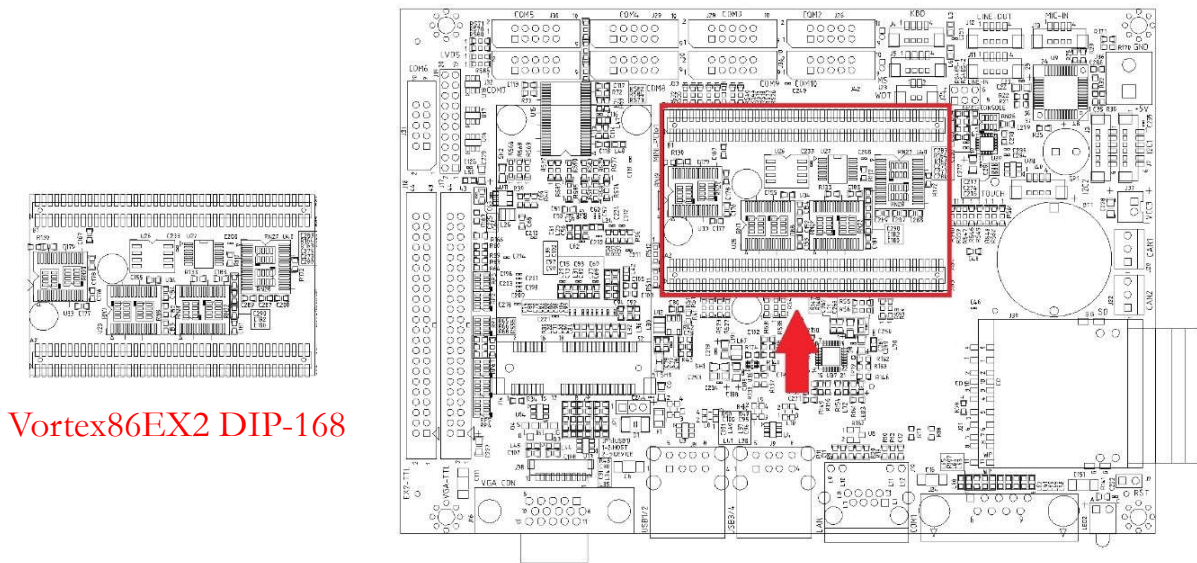
VEX2-6427-5C4EE/VEX2-6427-5C4NE
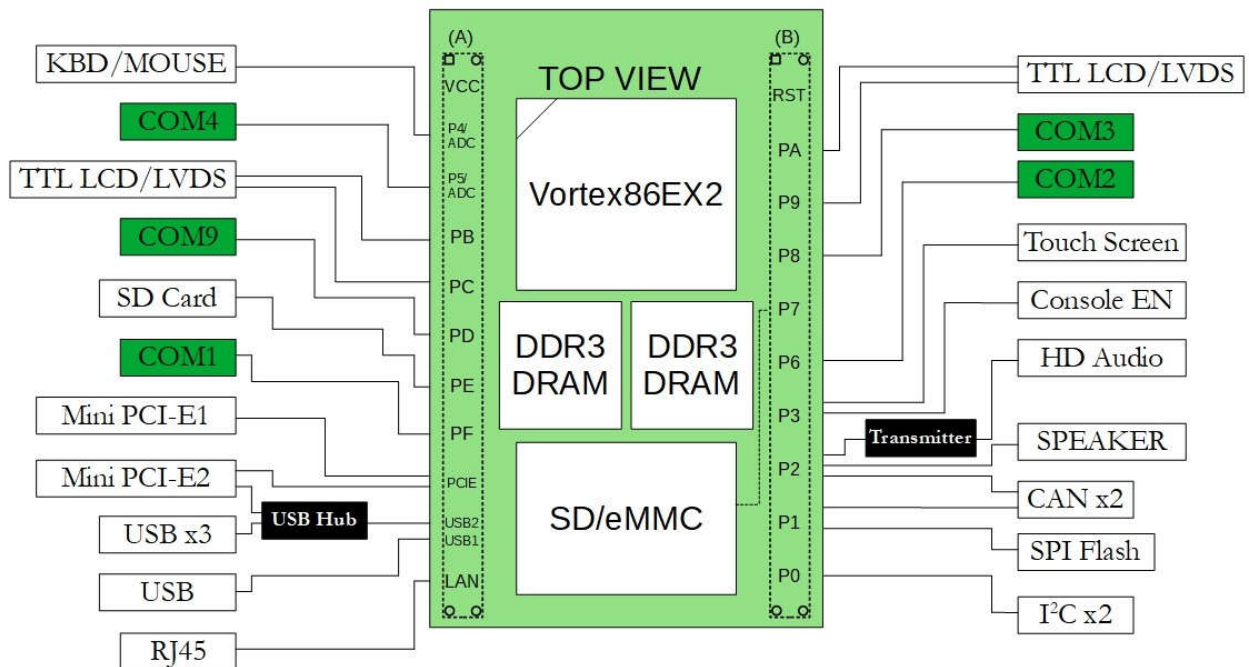
Vortex86EX2-DIP168

VEX2-6427-10C4VEE / VEX2-6427-10C4VNE
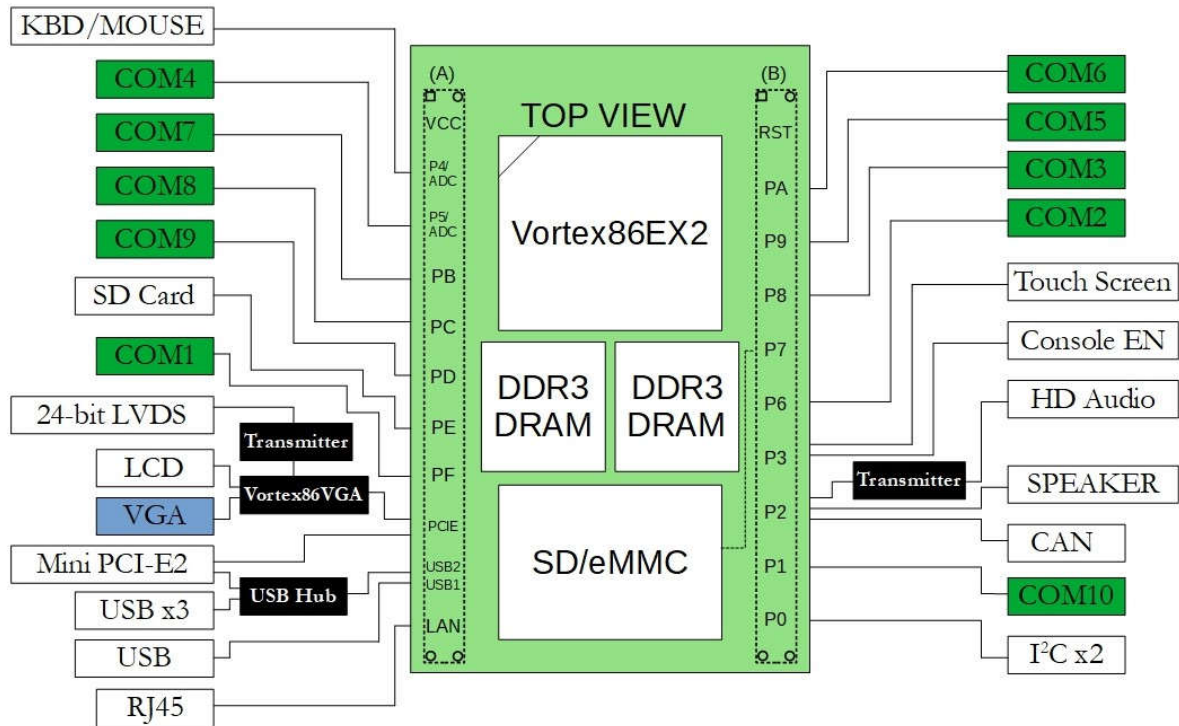
Vortex86EX2-DIP168

VEX2-6427-5C3NE
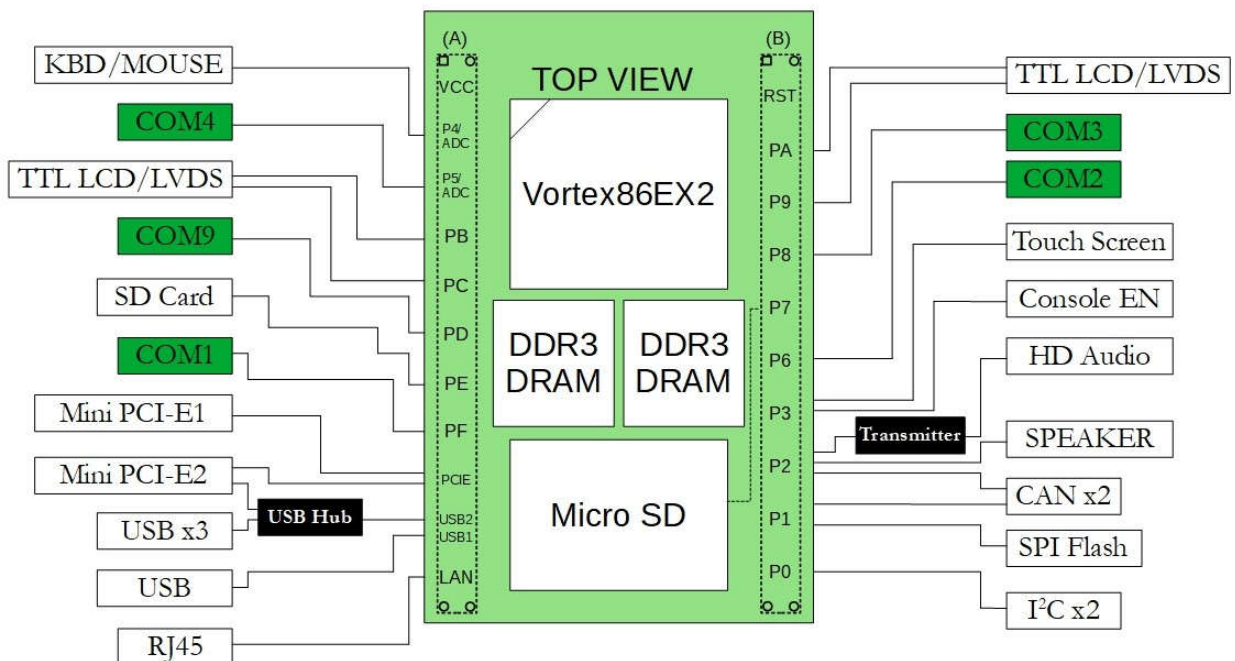
Vortex86EX2-DIP168

1.3   Specifications

Processor	DM&P Vortex86EX2 Processor – 600MHz
RAM	512MB/1GB DDR3 Onboard
BIOS	Coreboot BIOS
Expansion	MiniPCIe x2 (Option)
Display	Integrated 2D VGA chip with VGA and TFT Flat Panel Interface Support VGA: resolution up to 1024 x 768 @ 60Hz LCD: resolution up to 1024 x 768 @ 60Hz LVDS: resolution up to 1024 x 768 @ 60Hz, single channel 24-bit
LAN	Integrated 10/100Mbps Ethernet
Audio	Realtek ALC262 Buzzer
Disk Support	SD Card Micro SD Card/eMMC (Option)
I/O Interface	COM x10 (2x RS232/485) I^2C x2 PS/2 x 2 USB x4 Touch function x1 (Option) CAN bus x2 (Option) 12-bit ADC x 8 (Option)
Connectors	1.25mm 4-pin wafer for Line-in, Line-out, MIC-in x3 2.0mm 44-pin box header for LCD x1 15-pin D-sub female connector for VGA x1 SD Card slot x1 1.25mm 44-pin box header for LCD x1 2.54mm 3-pin molex for CAN Bus x2 1.25mm 4-pin wafer for Mouse x1 2.0mm 44-pin box header for LCD x1 2.0mm 20-pin header for LVDS x1 RJ45 connector x1 1.25mm 4-pin wafer for Touch function x1 (Option)
Power Requirement	5VDC @ 670mA
Operating Temp.	-20℃ to +70℃ -40℃ to +85℃ (Option)

Dimensions	102 x 146mm
Weight	130g
Operating System Support	Windows Embedded Compact 7 Windows Embedded CE6.0 QNX FreeBSD Linux DOS

1.4   Ordering Information

PART NO.	VEX2-6427-5C4EE	VEX2-6427-10C4VEE	VEX2-6427-5C3NE	VEX2-6427-5C4NE	VEX2-6427-10C4VNE
CPU Speed	600MHz	600MHz	600MHz	600MHz	600MHz
DRAM (DDR3)	1GB	1GB	512MB	1GB	1GB
Disk Support	SD Card/ 4GB eMMC	SD Card/ 4GB eMMC	SD Card/ Micro SD Card	SD Card/ Micro SD Card	SD Card/ Micro SD Card
Display	Frame Buffer LCD/LVDS	LCD/LVDS /VGA	Frame Buffer LCD/LVDS	Frame Buffer LCD/LVDS	LCD/LVDS /VGA
LAN	1				
USB (v2.0)	4				
COM	5	10	5	5	10
I²C	2				
CAN Bus	2	1	2	2	1
Audio	Line-in / Line-out / MIC-in / Buzzer				
MiniPCIe	2	1	2	2	1

Optional Accessary

CABLE-SET-6427-10C	Cable set for VEX2-6427-10C (RS232 x9, Audio x3, PS2 KB, PS2 Mouse)
CABLE-SET-6427-5C	Cable set for VEX2-6427-5C (RS232 x4, Audio x3, PS2 KB, PS2 Mouse)

2 Hardware Information

2.1   Board Dimension
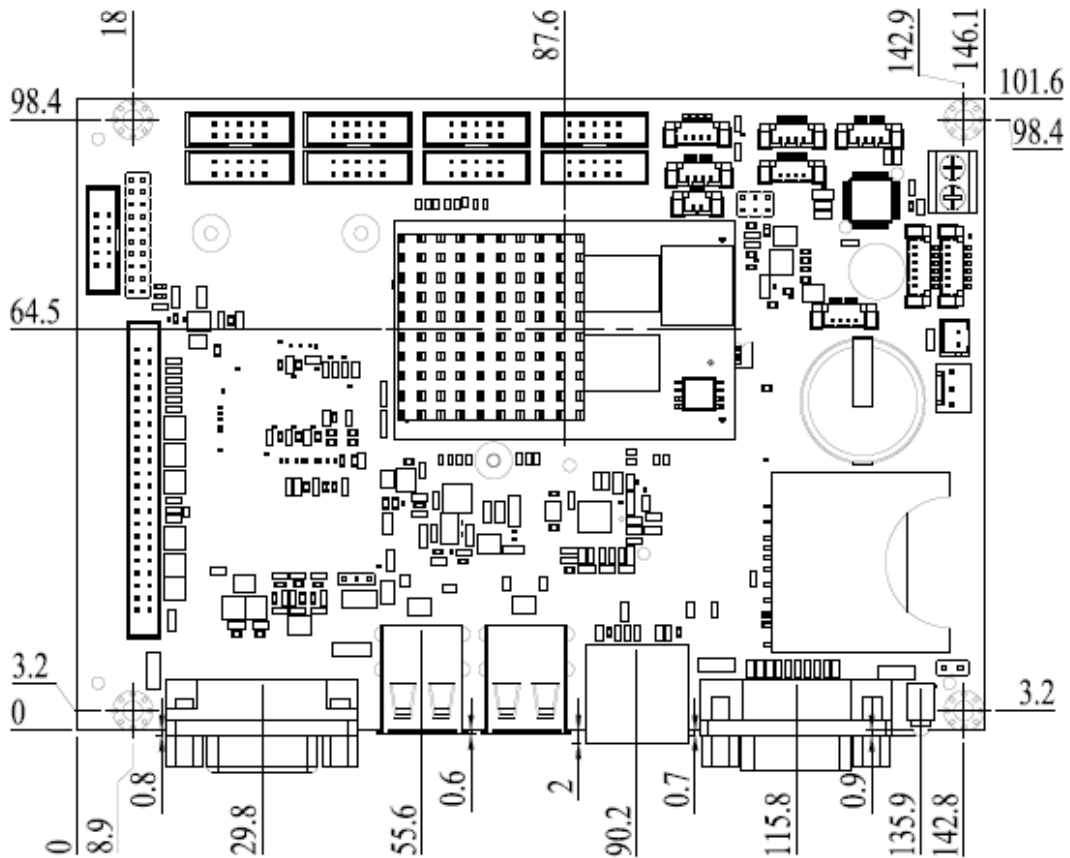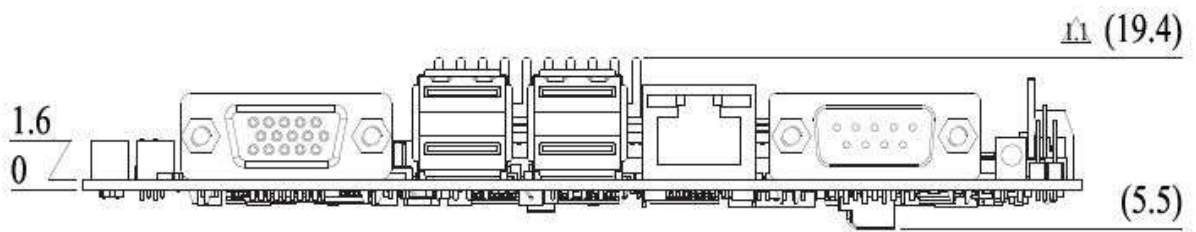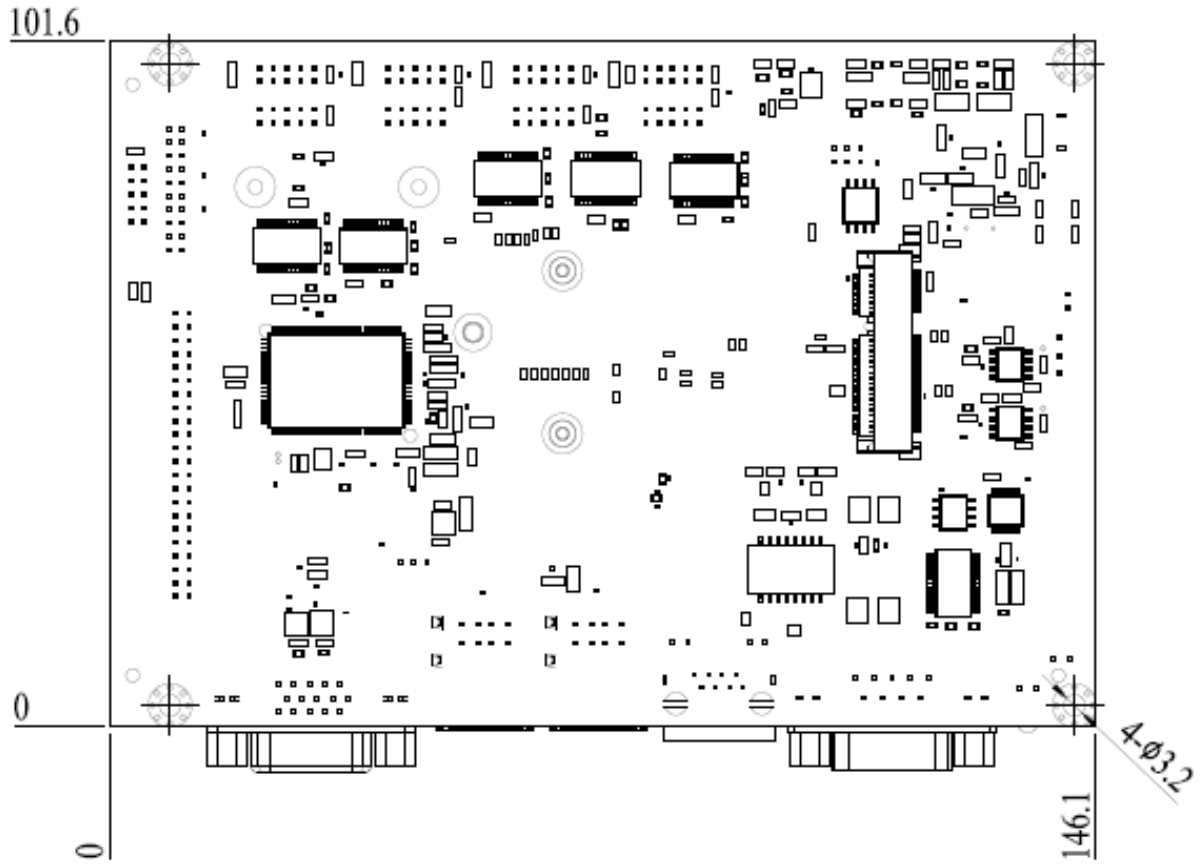
2.2   Board Outline

VEX2-6427-10C4VNE / VEX2-6427-10C4VEE

- Top:
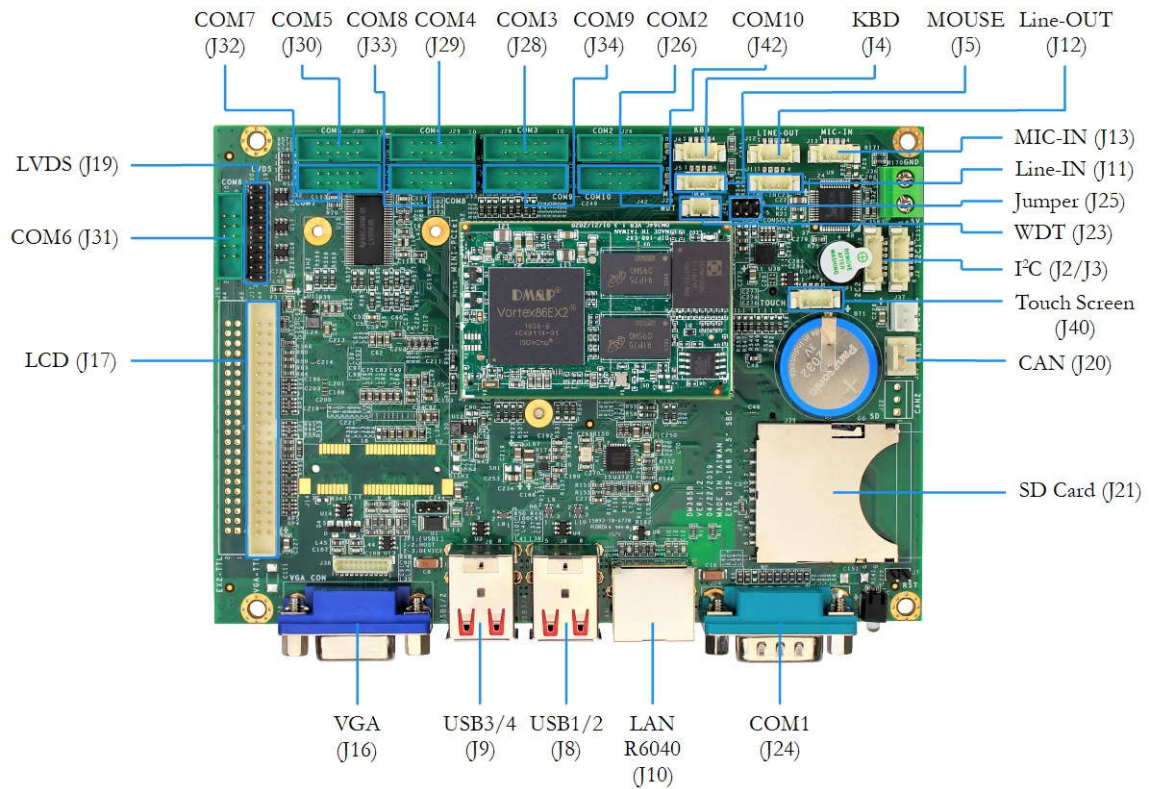
- Bottom:
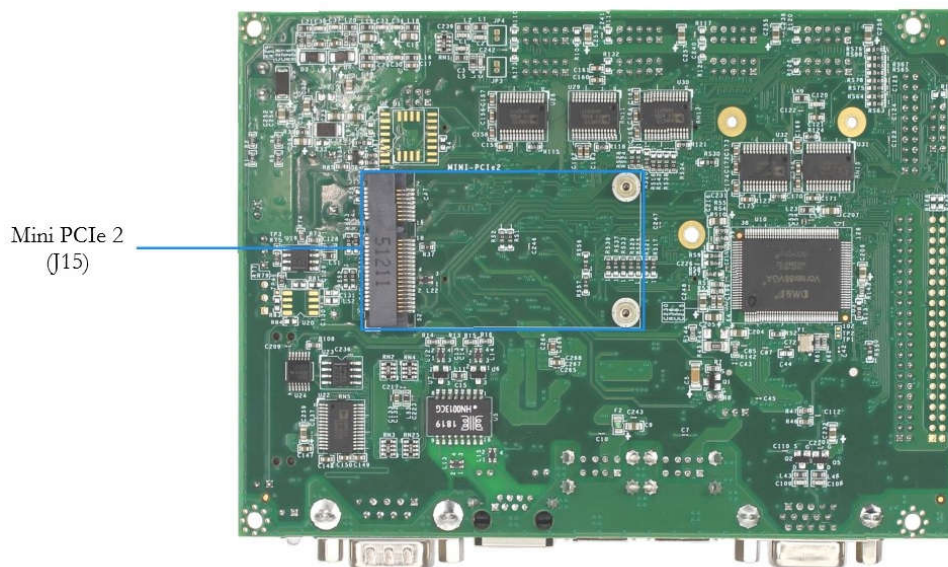
VEX2-6427-5C4NE / VEX2-6427-5C4EE / VEX2-6427-5C3NE

- Top:
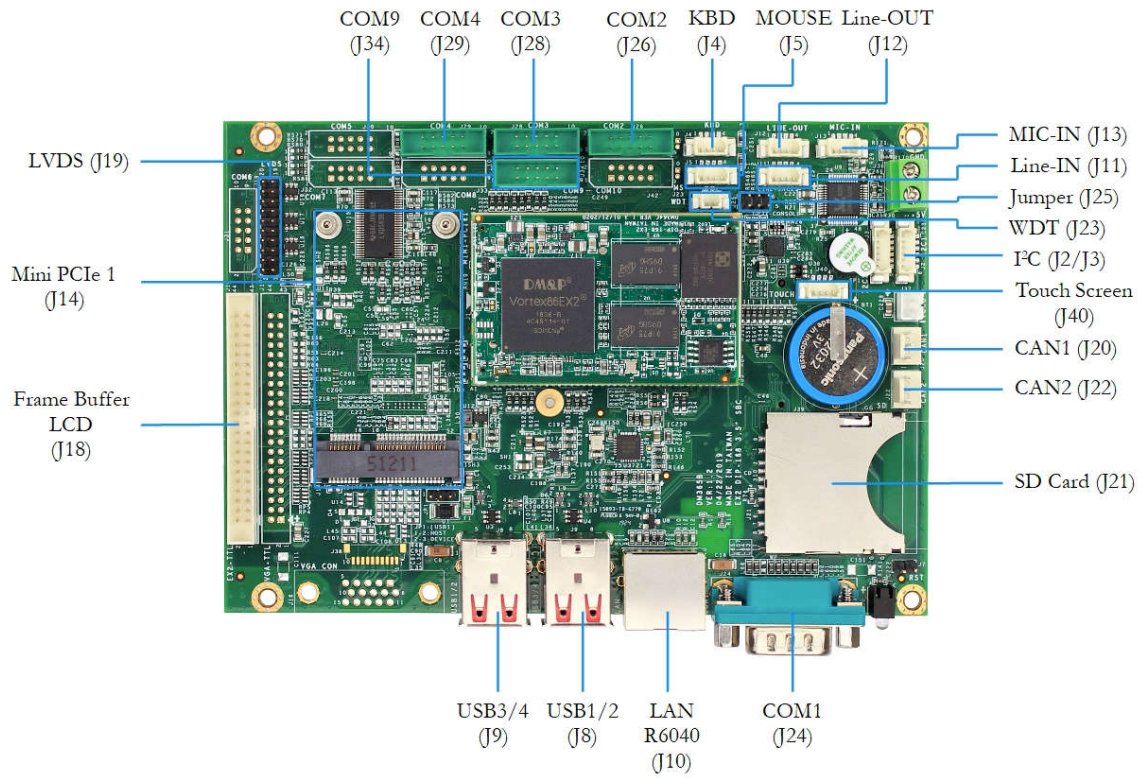
- Bottom:
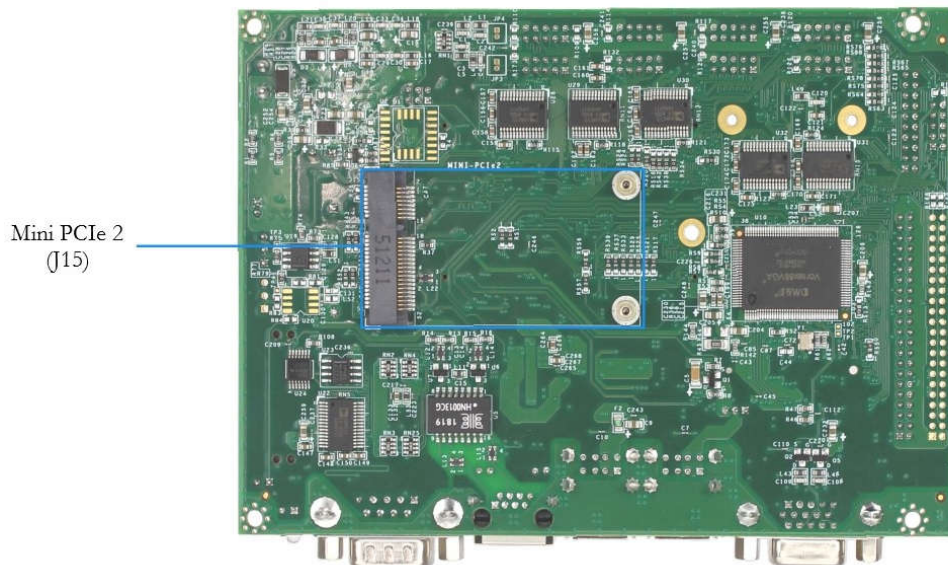
2.3   Connector Location
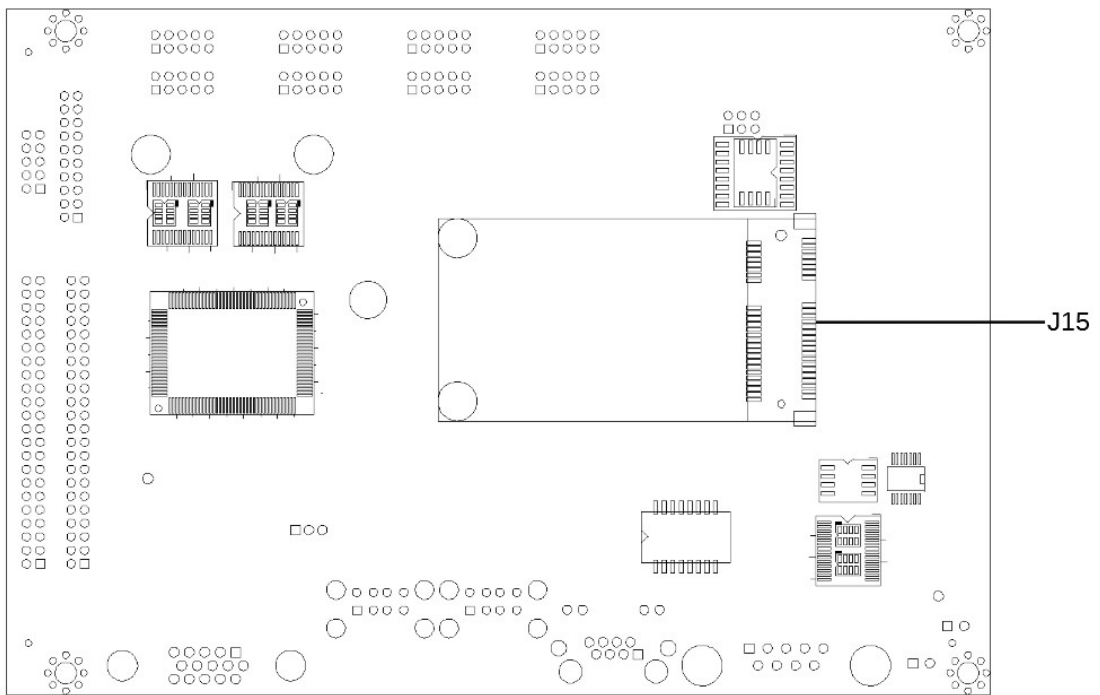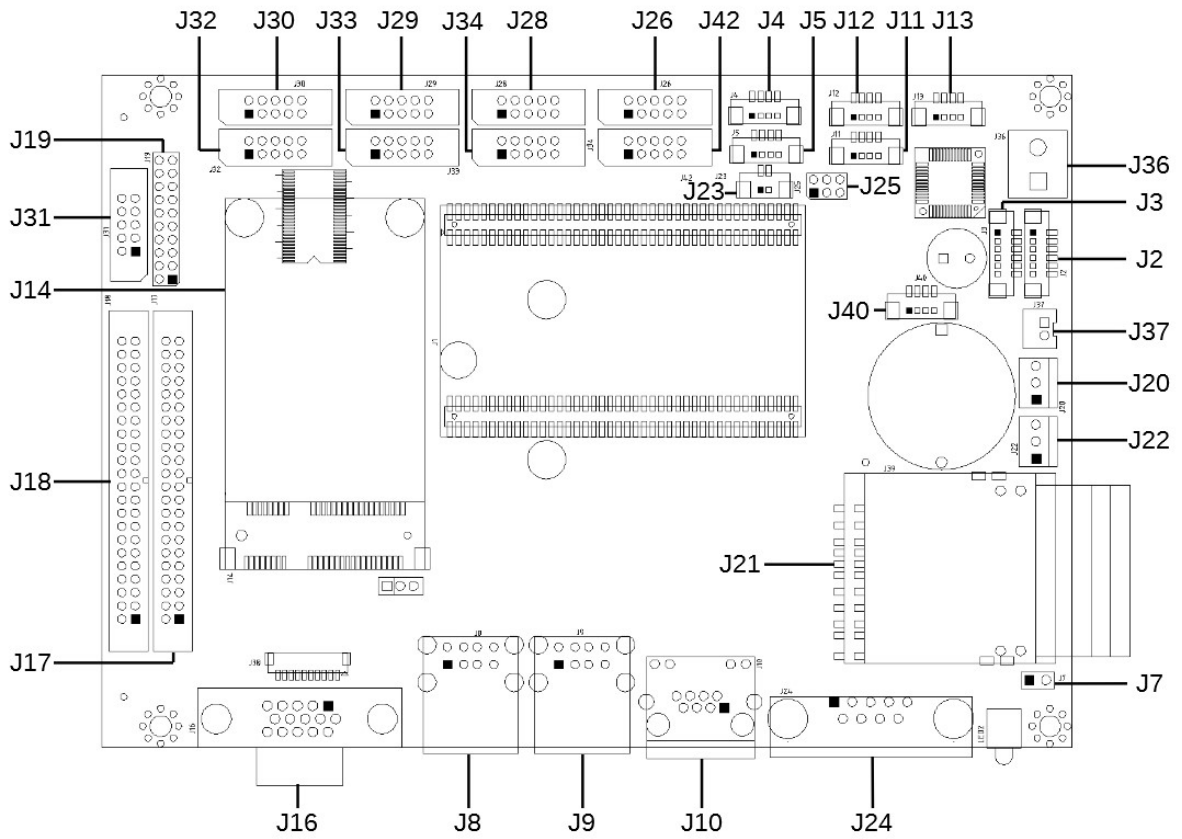
2.4   Connector and Jumper Summary

Nbr.	Name	Type of Connections	Nbr of Pin
J2	I²C 1	Wafer, 1.25mm, 6x1	6
J3	I²C 2	Wafer, 1.25mm, 6x1	6
J4	KBD	Wafer, 1.25mm, 4x1	4
J5	Mouse	Wafer, 1.25mm, 4x1	4
J7	RESET	Pin Header, 2.54mm, 2x1	2
J8	USB1/2	Type A USB Connector	12
J9	USB2/3	Type A USB Connector	12
J10	LAN	RJ45 Connector	8
J11	Line-IN	Wafer, 1.25mm, 4x1	4
J12	Line-OUT	Wafer, 1.25mm, 4x1	4
J13	MIC-IN	Wafer, 1.25mm, 4x1	4
J14	MiniPCI-EXP1	Standard Mini PCI Express Connector	52
J15	MiniPCI-EXP2	Standard Mini PCI Express Connector	52
J16	VGA	D-Sub Female	15
J17	LCD	LCD Connector, 2.0mm, 22x2	44
J18	Frame Buffer LCD	LCD Connector, 2.0mm, 22x2	44
J19	24-bit LVDS	Pin Header, 10x2	20
J20	CAN1	Molex Header, 2.54mm, 3x1	3
J21	SD Card slot		
J22	CAN2	Molex Header, 2.54mm, 3x1	3
J23	Watch Dog Timer	Pin Header, 1.25mm, 2x1	2
J24	COM1 RS232/485 (TTL Option)	D-Sub Male	9
J25A	RS232/485 Jumper Switch for COM1	Pin Header, 2.0mm, 2x1	2
J25B	RS232/485 Jumper Switch for COM2	Pin Header, 2.0mm, 2x1	2
J25C	Console_EN	Pin Header, 2.0mm, 2x1	2
J26	COM2 RS232/485 (TTL/ADC Option)	Box Header, 2.0mm, 5x2	10
J28	COM3 RS232 (TTL Option)	Box Header, 2.0mm, 5x2	10
J29	COM4 RS232 (TTL Option)	Box Header, 2.0mm, 5x2	10
J30	COM5 RS232 (TTL Option)	Box Header, 2.0mm, 5x2	10

J31	COM6 RS232 (TTL Option)	Box Header, 2.0mm, 5x2	10
J32	COM7 RS232 (TTL Option)	Box Header, 2.0mm, 5x2	10
J33	COM8 RS232 (TTL Option)	Box Header, 2.0mm, 5x2	10
J34	COM9 RS232 (TTL Option)	Box Header, 2.0mm, 5x2	10
J36	Power Connector	Terminal Block, 5.0mm, 2x1	2
J37	3.3V Connector	Box Header, 2.0mm, 2x1	2
J38	VGA	Pin Header, 1.0mm, 10x1	10
J39	Micro SD Card slot		
J40	Touch Screen	Pin Header, 1.25mm, 4x1	4
J42	COM10 RS232 (TTL Option)	Box Header, 2.0mm, 5x2	10

2.5   Pin Assignments & Jumper Settings

J2: I²C 1
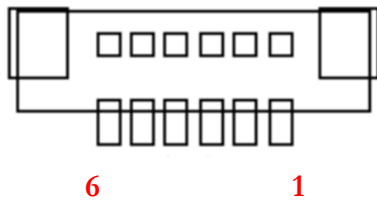
Pin#	Single Name
1.	VCC (+5V)
2	GND
3	I2C0_SCL
4	I2C0_SDA
5	NC
6	VCC3 (+3.3V)

J3: I²C 2
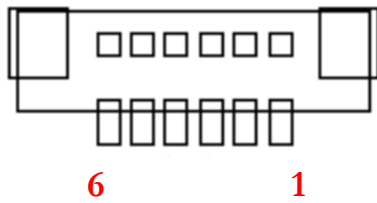
Pin#	Single Name
1.	VCC (+5V)
2	GND
3	I2C1_SCL
4	I2C1_SDA
5	NC
6	VCC3 (+3.3V)

J4: KBD
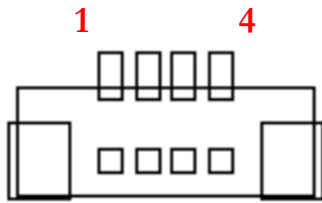
Pin#	Single Name
1.	KBCLK
2	KBDATA
3	GND
4	VCC (+5V)

J5: Mouse
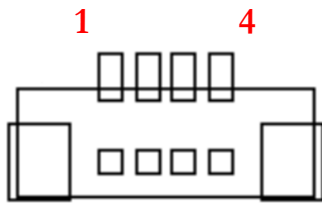
Pin#	Single Name
1.	MSCLK
2	MSDATA
3	GND
4	VCC (+5V)

J7: Reset
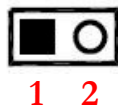
Pin#	Single Name
1.	RESET - 1
2	GND

J8: USB1/2

Pin#	Single Name	Pin #	Single Name
1.	VBUS1	5	VCC (+5V)
2	USBD0-	6	USBD1-
3	USBD0+	7	USBD1+
4	GND	8	GND
9	GGND	11	GGND
10	GGND	12	GGND

J9: USB2/3

Pin#	Single Name	Pin #	Single Name
1.	VCC (+5V)	5	VCC(+5V)
2	USBD2-	6	USBD3-
3	USBD2+	7	USBD3+
4	GND	8	GND
9	GGND	11	GGND
10	GND	12	GGND

J10: LAN

Pin#	Single Name	Pin #	Single Name
L1.	TD+	L2	TD-
L3	RO+	L4	NC
L5	NC	L6	RO-
L7	NC	L8	NC
L9	VCC3 (+3.3V)	L10	PLED0
L11	VCC3 (+3.3V)	L12	PLED1
H1	HOLE	H2	HOLE

J11: Line-IN
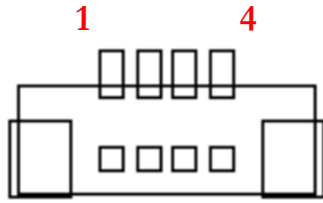
Pin#	Single Name
1.	LINE_IN_R1
2	GND_AUD
3	LINE_IN_L1
4	GND_AUD

J12: Line-OUT
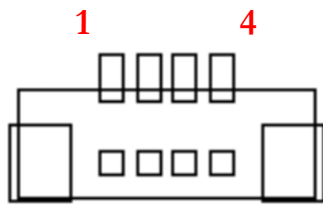
Pin#	Single Name
1.	LOUT_R1
2	GND_AUD
3	LOUT_L1
4	GND_AUD

J13: MIC-IN
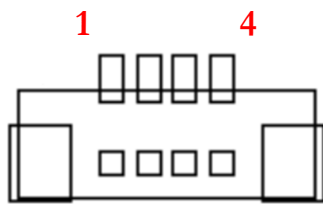
Pin#	Single Name
1.	MIC_IN_R1
2	GND_AUD
3	MIC_IN_L1
4	GND_AUD

J14: MiniPCI-EXP1 (For VEX2-6427-5C model only)

Pin#	Single Name	Pin #	Single Name
1.	VCC3 (+3.3V)	2	VCC3 (+3.3V)
3	NC	4	GND
5	NC	6	NC
7	NC	8	NC
9	GND	10	NC
11	PE1_INI_CLK-	12	NC
13	PE1_MINI_CLK+	14	NC
15	GND	16	NC
	Mechanical Key		
17	NC	18	GND
19	NC	20	NC
21	GND	22	PE1_RST
23	PE1_MINI_RX-	24	VCC3 (+3.3V)
25	PE1_MINI_RX+	26	GND
27	GND	28	NC
29	GND	30	NC
31	PE1_MINI_TX-	32	NC
33	PE1_MINI_TX+	34	GND
35	GND	36	NC
37	GND	38	NC
39	VCC3 (+3.3V)	40	GND
41	VCC3 (+3.3V)	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	GND
51	NC	52	VCC3 (+3.3V)

J15: MiniPCI-EXP2

Pin#	Single Name	Pin #	Single Name
1.	VCC3 (+3.3V)	2	VCC3 (+3.3V)
3	NC	4	GND
5	NC	6	NC
7	NC	8	NC
9	GND	10	NC
11	PE0_CLK-	12	NC
13	PE0_CLK+	14	NC
15	GND	16	NC
Mechanical Key			
17	NC	18	GND
19	NC	20	NC
21	GND	22	PE1_RST
23	PE0_RXO-	24	VCC3 (+3.3V)
25	PE0_RXO+	26	GND
27	GND	28	NC
29	GND	30	NC
31	PE0_TXO-	32	NC
33	PE0_TXO+	34	GND
35	GND	36	LUSBD4-
37	GND	38	LUSBD4+
39	VCC3 (+3.3V)	40	GND
41	VCC3 (+3.3V)	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	GND
51	NC	52	VCC3 (+3.3V)

J16: VGA (For VEX2-6427-10C model only)
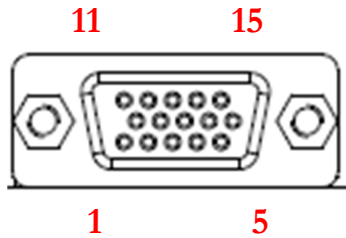
Pin#	Single Name	Pin #	Single Name
1.	ROUT	2	GOUT
3	BOUT	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	DDCDAT_A
13	HSYNC_A	14	VSYNC_A
15	DDCCLK_A		

J17: LCD

Pin#	DIGITAL 18-BIT	RGB 24-BIT	Pin#	DIGITAL 18-BIT	RGB 24-BIT
1	3.3V	3.3V	23	B0	B2
2	3.3V	3.3V	24	B1	B3
3	G2	G4	25	B2	B4
4	G3	G5	26	B3	B5
5	G4	G6	27	B4	B6
6	G5	G7	28	B5	B7
7	-	R0	29	-	G0
8	-	R1	30	-	G1
9	R0	R2	31	G0	G2
10	R1	R3	32	G1	G3
11	R2	R4	33	-	-
12	R3	R5	34	-	-
13	R4	R6	35	-	-
14	R5	R7	36	XCLK	XCLK
15	GND	GND	37	-	-
16	-	-	38	DEN	DEN
17	-	-	39	-	-
18	-	-	40	HSYNC	HSYNC
19	NC	NC	41	-	-
20	GND	GND	42	VSYNC	VSYNC
21	-	B0	43	ADJ	ADJ
22	-	B1	44	VDDEN	VDDEN

J18: Frame Buffer LCD

Pin#	DIGITAL 18-BIT	RGB 24-BIT	Pin#	DIGITAL 18-BIT	RGB 24-BIT
1	3.3V	3.3V	23	B0	B2
2	3.3V	3.3V	24	B1	B3
3	G2	G4	25	B2	B4
4	G3	G5	26	B3	B5
5	G4	G6	27	B4	B6
6	G5	G7	28	B5	B7
7	-	R0	29	-	G0
8	-	R1	30	-	G1
9	R0	R2	31	G0	G2
10	R1	R3	32	G1	G3
11	R2	R4	33	-	-
12	R3	R5	34	-	-
13	R4	R6	35	-	-
14	R5	R7	36	XCLK	XCLK
15	GND	GND	37	-	-
16	-	-	38	DEN	DEN
17	-	-	39	-	-
18	-	-	40	HSYNC	HSYNC
19	NC	NC	41	-	-
20	GND	GND	42	VSYNC	VSYNC
21	-	B0	43	ADJ	ADJ
22	-	B1	44	VDDEN	VDDEN

J19: 24-bit LVDS
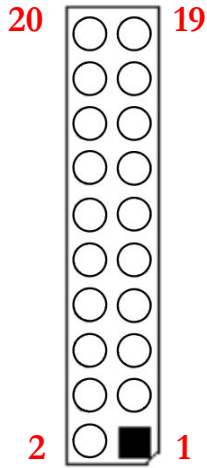
Pin#	Single Name	Pin #	Single Name
1.	VCC3 (+3.3V) _LVDS	2	VCC3 (+3.3V) _LVDS
3	GND	4	GND
5	Y0P	6	Y0M
7	Y1M	8	GND
9	GND	10	Y1P
11	Y2P	12	Y2M
13	CLKOUTM	14	GND
15	GND	16	CLKOUTP
17	Y3M	18	GND
19	GND	20	Y3P

J20: CAN1
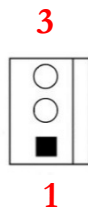
Pin#	Single Name
1	CAN0_H
2	CAN0_L
3	GND

J21: SD Card slot

Pin#	Single Name
1	DAT3
2	CMD
3	VSS1
4	VDD
5	CLK
6	VSS2
7	DAT0
8	DAT1
9	DAT2
10	Card Detect
11	Write Protect
12	Common Ground
13	Common Ground

J22: CAN2 (For VEX2-6427-5C model only)
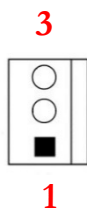
Pin#	Single Name
1	CAN1_H
2	CAN1_L
3	GND

J23: Watch Dog Timer
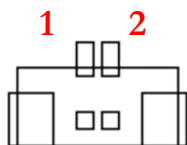
Pin#	Single Name
1	WDT
2	GND

J24: COM1 RS232/485 (TTL Option)
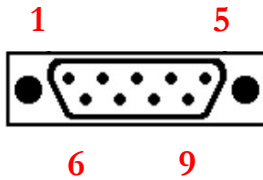
Pin#	Single Name	Pin #	Single Name
1.	COM_DCD1/RS485	2	COM_RXD1/RS485
3	COM_TXD1	4	COM_DTR1
5	GND	6	COM_DSR1
7	COM_RTS1	8	COM_CTS1
9	COM_RI1		

J25A: RS232/485 Jumper Switch for COM1
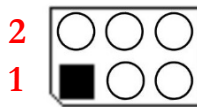
Pin#	Status	Assignment
1-2	Open	RS232
1-2	Short	RS485

J25B: RS232/485 Jumper Switch for COM2
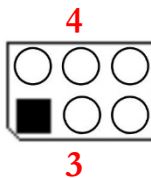
Pin#	Status	Assignment
3-4	Open	RS232
3-4	Short	RS485

J25C: Console_EN
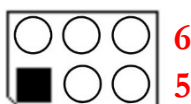
Pin#	Status	Assignment
5-6	Open	None
5-6	Short	Console Mode

J26: COM2 RS232/485 (TTL/ADC Option)
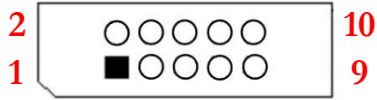
Pin#	Single Name	Pin #	Single Name
1.	DCD2/RS485	2	RXD2/RS485
3	TXD2	4	DTR2
5	GND	6	DSR2
7	RTS2	8	CTS2
9	RI2	10	NC

J28: COM3 RS232 (TTL Option)
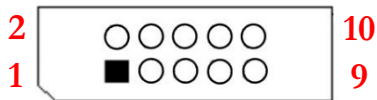
Pin#	Single Name	Pin #	Single Name
1.	DCD3	2	RXD3
3	TXD3	4	DTR3
5	GND	6	DSR3
7	RTS3	8	CTS3
9	RI3	10	NC

J29: COM4 RS232 (TTL Option)
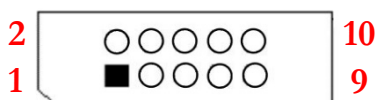
Pin#	Single Name	Pin #	Single Name
1.	DCD4	2	RXD4
3	TXD4	4	DTR4
5	GND	6	DSR4
7	RTS4	8	CTS4
9	RI4	10	NC

J30: COM5 RS232 (TTL Option, VEX2-6427-10C model only)
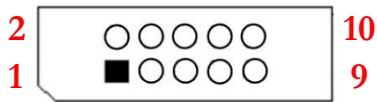
Pin#	Single Name	Pin #	Single Name
1.	DCD5	2	RXD5
3	TXD5	4	DTR5
5	GND	6	DSR5
7	RTS5	8	CTS5
9	RI5	10	NC

J31: COM6 RS232 (TTL Option, VEX2-6427-10C model only)
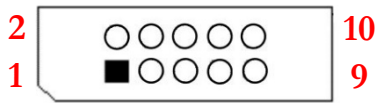
Pin#	Single Name	Pin #	Single Name
1.	DCD6	2	RXD6
3	TXD6	4	DTR6
5	GND	6	DSR6
7	RTS6	8	CTS6
9	RI6	10	NC

J32: COM7 RS232 (TTL Option, VEX2-6427-10C model only)
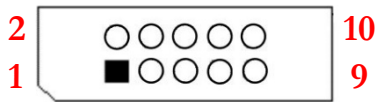
Pin#	Single Name	Pin #	Single Name
1.	DCD7	2	RXD7
3	TXD7	4	DTR7
5	GND	6	DSR7
7	RTS7	8	CTS7
9	RI7	10	NC

J33: COM8 RS232 (TTL Option, VEX2-6427-10C model only)
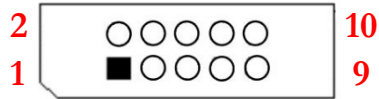
Pin#	Single Name	Pin #	Single Name
1.	DCD8	2	RXD8
3	TXD8	4	DTR8
5	GND	6	DSR8
7	RTS8	8	CTS8
9	RI8	10	NC

J34: COM9 RS232 (TTL Option)
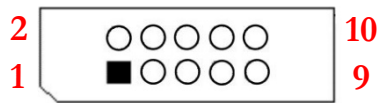
Pin#	Single Name	Pin #	Single Name
1.	DCD9	2	RXD9
3	TXD9	4	DTR9
5	GND	6	DSR9
7	RTS9	8	CTS9
9	RI9	10	NC

J36: Power Connector

Pin#	Single Name	Pin #	Single Name
1.	VCC (+5V)	2	GND

J37: 3.3V Connector

Pin#	Single Name	Pin #	Single Name
1.	VCC (+3.3V)	2	GND

J40: Touch Screen (Option)
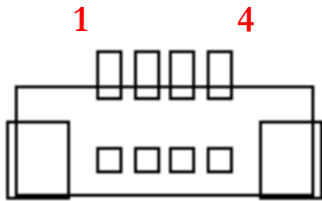
Pin#	Single Name
1	Y-
2	X-
3	Y+
4	X+

J42: COM10 RS232 (TTL Option, VEX2-6427-10C model only)
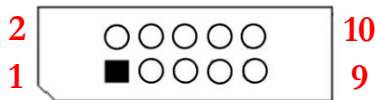
Pin#	Single Name	Pin #	Single Name
1.	DCD10	2	RXD10
3	TXD10	4	DTR10
5	GND	6	DSR10
7	RTS10	8	CTS10
9	RI10	10	NC

2.6   System Mapping

Memory Mapping		
Address	**Description**	**Usage**
00000000 – 0009FFFF	System RAM	Yes
000A0000 – 000AFFFF	EGA/VGA Video Memory	Yes
000B0000 – 000B7FFF	MDA RAM, Hercules graphics display RAM	Yes
000B8000 – 000BFFFF	CGA display RAM	Yes
000C0000 – 000C7FFF	EGA/VGA BIOS ROM	Yes
000C8000 – 000CFFFF	Expansion ROM Space	
000CC000 – 000CFFFF	Expansion ROM Space	
000D0000 – 000D7FFF	Expansion ROM space	
000D8000 – 000D8FFF	Expansion ROM Space	
000DC000 – 000DFFFF	Expansion ROM Space	
000E0000 – 000EFFFF	BIOS	
000F0000 – 000FFFFF	BIOS	Yes
FEFDBC00 – FEFDBCFF	Standard Open HCD USB Host Controller**	Yes
FEFBB400 – FEFBB4FF	Onboard Ethernet Adapter**	Yes
FEFDB800 – FEFDBFFF	Standard Enhanced PCI to USB Host Controller**	Yes

**: Dynamical configuring PCI device: Meaning that the location of each allocation may be different

I/O Mapping		
Address	**Description**	**Usage**
0000h – 000Fh	DMA 8237-1	Yes
0020h – 0021h	PIC 8259-1	Yes
0022h – 0023h	Indirect Access Registers (6117D configuration port)	Yes
0040h –0043h	Timer Counter 8254	Yes
0060h	Keyboard / Mouse data port	
0061h	Port B + NMI control port	Yes
0062h – 0063h	8051 download 4k address counter	
0064h	Keyboard/ Mouse status/ command port	
0065h	WatchDog0 reload counter	
0070h – 0071h	CMOS RAM port	Yes
0072h – 0075h	MTBF control register	Yes
0078h – 007Ch	GPIO port 0,1,2,3,4 default setup	Yes
0080h – 008Fh	DMA page register	
0092h	System control register	Yes
0093h – 0097h	GPIO port 6,7,8,9, A direction control	Yes
0098h – 009Dh	GPIO port 0,1,2,3,4,5 direction control	Yes
00A0h – 00A1h	PIC 8259-2	Yes
00A8h – 00ADh	WatchDog1 control counter	Yes
00AEh	WatchDog1 reload counter	Yes
00C0h – 00DFh	DMA 8237-2	Yes
00E0h – 00EFh	DOS 4G Page access	Yes
0100h – 0105h	GPIO port 5,6,7,8,9, A default setup	Yes
0170h – 0177h	IDE 1(IRQ 15)	Yes
0260h – 0267h	COM6 (IRQ 3)	Yes
0268h – 026Fh	COM8 (IRQ 11)	Yes
0278h – 027Fh	Printer port (IRQ7, DMA 0)	Yes
02E0h – 02E7h	COM10 (IRQ 3)	Yes
02E8h – 02EFh	COM4 (IRQ 11)	Yes
02F8h – 02EFh	COM2 (IRQ 3)	Yes
0340h – 0347h **	CAN BUS0	
0348h – 034Fh **	CAN BUS1	
0360h – 0367h	COM5 (IRQ4)	Yes
0368h – 036Fh	COM7 (IRQ 10)	Yes
03E0h – 03E7h	COM9 (IRQ 4)	Yes

03E8h – 03EFh	COM3 (IRQ 10)	Yes
03F6h	IDE1 ATAPI device control write only register	Yes
03F8h – 03FFh	COM1 (IRQ 4)	Yes
0480h – 048Fh	DMA High page register	Yes
0490h – 0499h	Instruction counter register	Yes
04D0h – 04D1h	8259 Edge / level control register	Yes
0CF8h – 0CFFh	PCI configuration port	Yes
DE00h – DEFFh	On board LAN**	Yes
FB00h – FB07h	I2C0	
BIOS not currently set	I2C1	
FC00h – FC05h	SPI Flash BIOS control register	Yes
FC08h – FC0Dh	External SPI BUS control register	Yes

**: Dynamical configuring PCI device: Meaning that the location of each allocation may be different

IRQ Mapping		
Address	**Description**	**Usage**
IRQ0	System Timer	Yes
IRQ1	Keyboard Controller	Yes
IRQ2	Cascade for IRQ8~15	
IRQ3	Serial port 2	Yes
IRQ4	Serial port 1	Yes
IRQ5	USB	Yes
IRQ6	USB	
IRQ7	Printer Port	Yes
IRQ8	Real Timer Clock	Yes
IRQ9	NONE	Yes
IRQ10	Serial Port 3	Yes
IRQ11	Serial Port 4	Yes
IRQ12	Mouse	Yes
IRQ13	Math Coprocessor	Yes
IRQ14	Multimedia Device	Yes
IRQ15	Hard Disk Controller #2	Yes

3 Software Resources

3.1   ICOP Technical Resource Website

In the following website, you will find our latest user manuals,

including OS support resources systems such as evaluation images for

Windows Embedded Compact 7, Windows Embedded CE 6.0, and

Windows XP Embedded.

For details, please kindly visit the following link:

http://tech.icop.com.tw/

Technical support

Technical Support Directly from ICOP

To offer you more accurate and specific solutions for the technical situations you have, please prepare the information below before contacting ICOP:

— Product name and serial number
— Description of the H/W environment (i.e.: working temperature, I/O board information, information of connection between main board and IO boards, and/or other devices, etc.)
— Description of the S/W environment (i.e.: operating system, version, application software, and/or other related information, etc.)
— A detailed description and photos of the technical situation
— Any complement or technical situations you want ICOP more focusing on

User Manual Feedback

To make this user manual more complete, if you have any comments or feedbacks to this manual, please feel free to write to info@icop.com.tw or contact your ICOP sales representative.

Warranty

This product is warranted to be in good working order for a period of one year (12 months) from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it without additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise is accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description. Should you have questions about warranty and RMA service, please contact us directly.

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