华北工控
NORCO

FLX-2000

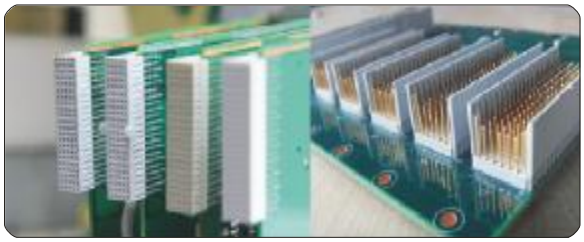
用户手册
USER'Manual

Industrial & Communication Computer

做中国最可信赖的工控产品

Special Anti-vibration Design

Feature 1. Air-tight Pin Connector



FLX modules adopt pin/socket connector. This kind of connector features strong anti-vibration, high reliability, oxidization resistant and a high transmission rate.

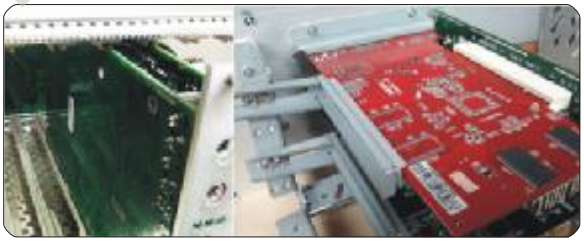
Feature 2. “No Wiring “ Connection

Modules interconnected via backplane. No complex interior wiring parts will enhance the stability of the total system, reducing the risks of wiring problems caused during production, transportation and operation.

Feature 3. 360°Spring Shock-absorber

FLX HDD utilizes spring vibration absorber for 360°overall damping, suitable for the device to work under different vibration intensity in some rugged occations such as railway, automobiles, ships or military,etc

Feature 4. Four Sides All-round Fixing



Boards of FLX series are fixed in four sides, securing the soundness and fastness of the boards during transportation and operation.

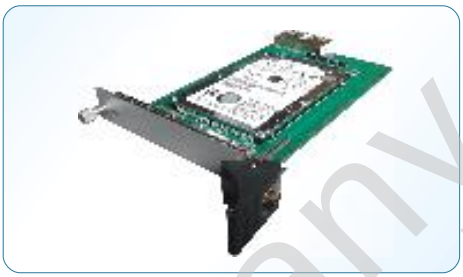
FLX Series Features Modular Design

FLX

1. PCI/PCIE Expansion Module

2. Motherboard Module

3. HDD Extension Module



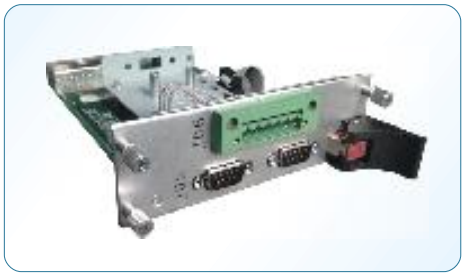
4. Module with Multiple USB

5. Vehicle UPS Module

6. Vehicle Vibration Absorber

7、 FLX2000 Motherboard Cooling Module

8. Interface Expansion Card

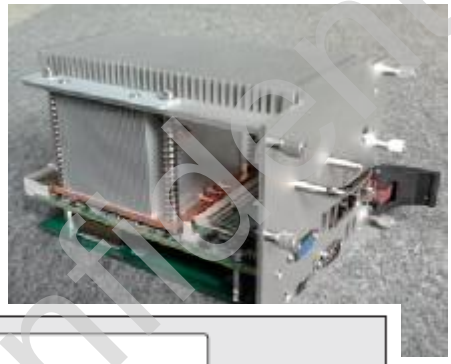


Content

1. Moduels Introduction

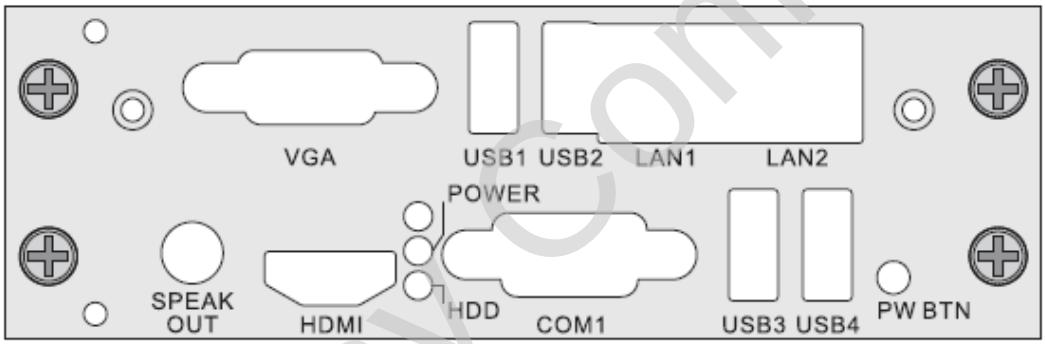
1.1 FLX2000 Motherboard Module

The motherboard is the core module of FLX-2000.This motherboard adopts Intel QM57 chipset and low power CPU: I7 660UE（1.33G,18W）or I7 620LE（2.0G,25W）; Onboard dual VGA or VGA+HDMI video out. I7 660UE CPU supports fanless module and the long term operation temperature supports up to 55 ℃.



Motherboard with dual VGA provides I/O: VGAX2, LANX2, USBX4, SPEAK OUTX1,LINE INX1,Switch X1, CF Card socket X1, DDR3 RAM slot X1.

I/Os with VGA+HDMI Motherboard: VGAX1, LANX2, USBX4, SPEAK OUTX1, COMX1, Switch X1,CF Card SocketX1, DDR3 RAM SlotX1.

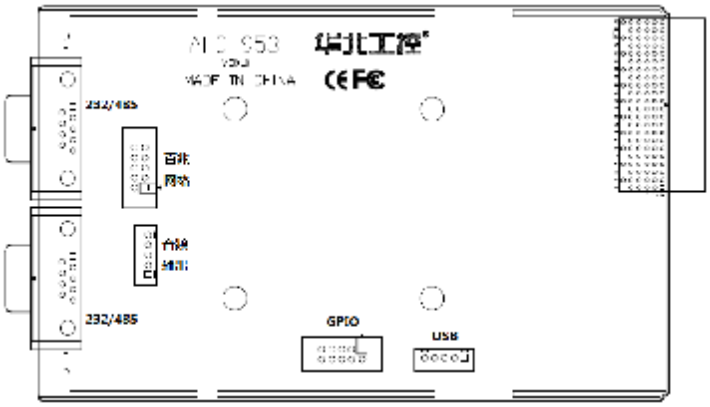


1.2 PBP-09C05 Backplane

Backplane is the key connection between the motherboard and the expansion cards. PBP-09C05 provides such extended Interface definitions as PCIEX8, PCIEX1, SATA, LPC, USB, LAN.

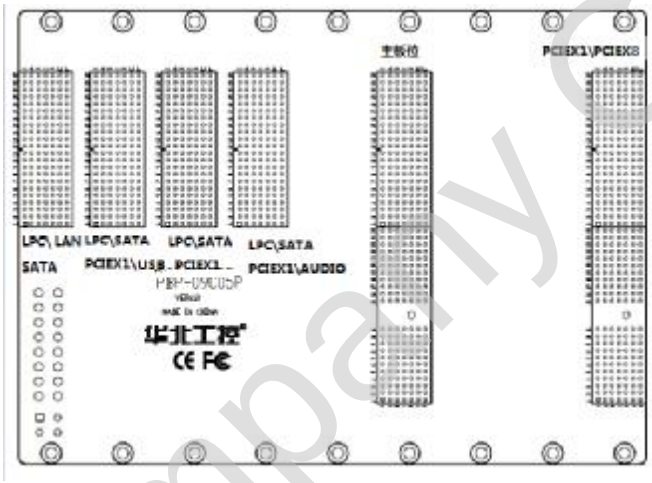
1.3 AFC-953 Interface Expansion Module

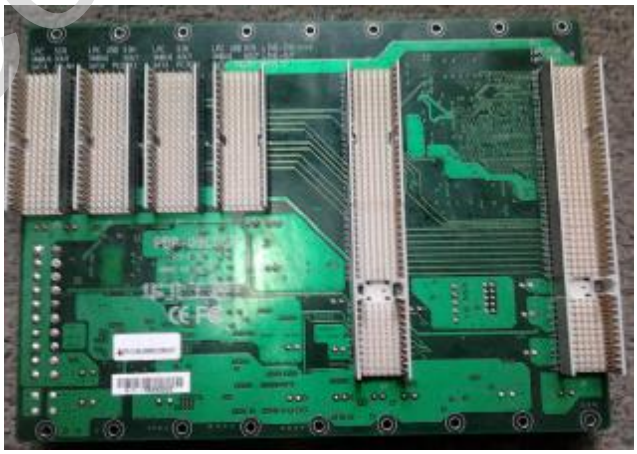
AFC-953 is to expand the interfaces for motherboard. The extended interfaces include: GPIO（2 GPI, 2GPO）,2x RS-232/485（optional）,1x USB, 1x 100 mega LAN（Pin）, Audio out（Pin）. This card needs to be connected on the backplane to provide extensible interfaces via PCIEX1 and USB slot.



1.4 PBP-09C05P Backplane

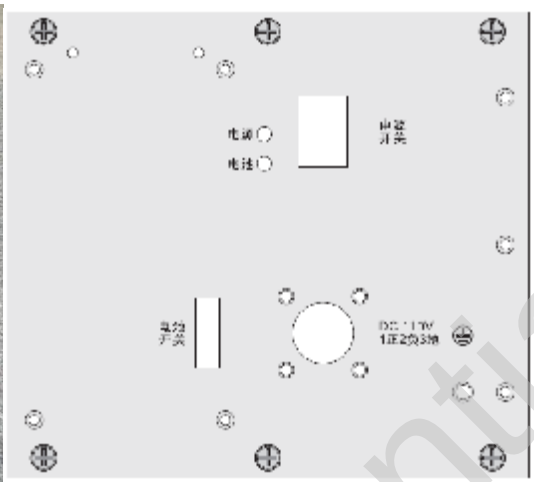
PBP-09C05P backplane features the support of PCI/PCIE modules. PBP-09C05P provides following extended interface definitions: PCIEX8, PCIEX1, SATA, LPC, USB, LAN.





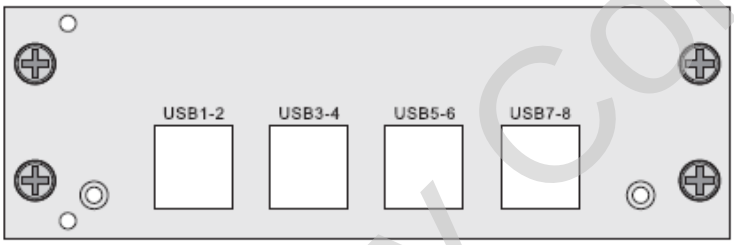
1.5 UPSHZD100B2 Vehicle Mini UPS

UPSHZD100B2 vehicle Mini UPS is specially designed for rail transportation applications. This UPS module adopts passive cooling technology, DC70V—DC140V input, long term operation temoerature up to 55℃ and 100W power output. This Mini UPS is powered by Lithium battery with battery capacity up to 1500mAh. UPSHZD100B2 is connected on the backplane with flexible connectors.



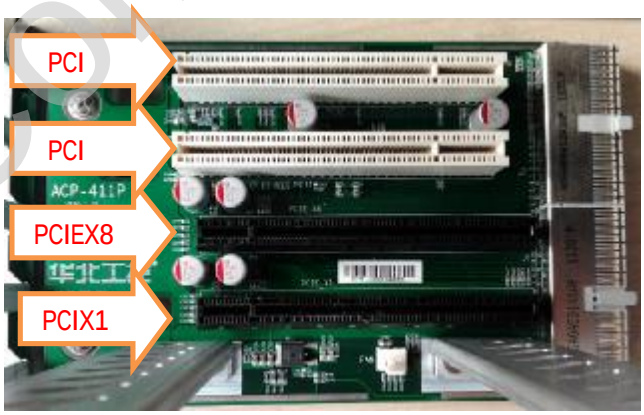
1.6 AFC-983U

AFC-983U is developed to address the demands from the industries that require for the applications of multiple USB ports. Board provides 8x USB3.0, offering an effective solution for the problem of USB Port connection broken when multiple USB ports in use. AFC-983U needs to be connected on the backplane so as to provide extension via PCIEX1.



1.7 ACP-411P PCI/PCIE Expansion Module

ACP-411P PCI/PCIE expansion module is specially designed for PCI/PCIE cards.This module supports 2x PCI, 1x PCIEX1, 1x PCIEX8. Fixed in three sides and the PCI/PCIE connecting finger will not be exposed and oxidized in the air.ACP-411P is connected on the backplane so as to provide extension via PCIEX1 and PCIEX8.



1.8 ACP-309S Vibration Absorber

ACP-309S is a vibration absorber module specially designed for the applications under vibration environment.Traditional damping methods have limits in its shock absorption amplitude and can not conduct a 360°overall damping. This module utilizes spring vibration absorber for 360°overall damping, suitable for the device to work under different vibration intensity in some rugged occations such as railway, automobiles, ships or military,etc. Different vibration amplitudes are caused in different application environments,a custom vibration isolator based on actual needs is necessary. Besides, this module supports up to 3x 2.5”HDD.

ACP-309S should be installed in PCIEX1 and SATA socket.

1.9 ACP-134S HDD Module

ACP-134S is a HDD module, supporting 2.5” HDD/IDE/SBC SS. With this module, it will be much easier to replace the hard disk.

2. Introduction to PC Configuration

2.1 FLX-300 for Rail Transportation

Vehicle Mounted Solution FLX300 incorporates: FLX2000 Passive Cooling Module, AFC-953 Interface Expansion Module, ACP-309S vibration absorber, UPSHZD100B2 Vehicle Mini UPS and PBP-09C05 backplane.

Specification

No.	Function Module	Technical Spec	Remark
1	Processor	Intel 1st Gen Core I7 660UE	Passive Cooling
2	HDD	Max. 3x 2.5”SATA	360°overall damping
3	Memory	1x DIMM slot,DDR3 RAM	
4	Interface	4x USB 2x 485（DB9） 1x VGA 1x HDMI Power Switch DC110V Input Dual Gigabit Adaptive Ehternet,	

No.	Function Module	Technical Spec	Remark
		RJ-45 Audio out	
6	OS	XPE, XP, linux	
7	Power	DC 110V Input	
8	Dimension	465mm*250mm*132mm	
9	Power Consumption	50W	

Test Results:

1. Temperature

Operating Environment:

a) Short-term Operation Temperature:-30℃～+70℃

b) Long-term Operation Temperature: -20℃～+55℃

c) Storage Temperature: -30℃～+70℃

2. Relative Humidity

≤93%（40℃）

3. Atmospheric Pressure

Able to function properly under 86-106kPa atmospheric pressure（Altitude≥3000m）

4. Vibration Test

Frequency: 10Hz～55Hz～10Hz, Vibration Amplitude:0.15mm, Sweep Speed≤1 oct/min, Cycle Times:5 times

5. Shock Test

Peak acceleration: 500m/S2, Pulse duration:11ms.

6. Insulation Resistance

The insulation resistance of all separate circuit should meet following requeirements:

a)Relative humidity ≤75%, If environmental temperature between 15～35℃, the value of insulation resistance should ≥20MΩ; Cable insultaion resistance value≥100MΩ.

b) Rlative humidity 70%, environmental temperature between 40±2℃, the insulation resistance value ≥0.5MΩ and cable insultaion resistance value ≥10MΩ.

7. Dielectric Strength (Dielectric Withstand Voltage Test)

Performed in 1500V DC within 1min, no evidence of flashover, mechanical damage, arcing or insulation breakdown.

8. Electric Stress Test

Performed power burn-in screening under rated power in lab for at least 72hrs.

9. EMC Test

a) Radio Disturbance

Radio disturbance limit meets GB9254 regulation: A level /B level radio disturbance limit.

b)EMC Immunity Test

Immunity limit lives up to GB/T17618 and meets industrial level testing standards

10. Electrostatic Level

6KV contact discharge and 8KV air discharge

11. Testing Standards Passed:

EN50155, TB/3034-2002, TB/3058-2002, TB/3021-2002

2.2 Standard Module--FLX-322

Vehicle Mounted Solution FLX322 incorporates: FLX2000 Active Cooling Module, ACP-309S vibration absorber (optional), AC220V ATX Vehicle Power Module, ACP-411P PCI\PCIE Expansion Module and PBP-09C05 backplane.

Specification

No.	Function Module	Technical Spec	Remark
1	Processor	Intel 1st Gen Core I7 660UE/620LE	Active Cooling
2	HDD	Max. 4x 2.5”SATA	
3	Memory	1x DIMM slot, DDR3 RAM	
4	Interface	4x USB 1x VGA 1x HDMI Power Switch	

No.	Function Module	Technical Spec	Remark
		AC220V Power Input Dual Gigabit Adaptive Ethernet, RJ-45 Audio Out 2x PCI slot 1x PCIEX8 slot 1x PCIEX1 slot	
6	OS	XPE，XP，linux	
7	Power	AC220V Input	
8	Dimension	465mm*250mm*132mm	
9	Power Consumption	60W	

1. Temperature

Operating Environment:

d) Short-term Operation Temperature:-30℃～+70℃ (noise below 55DB)

e) Long-term Operation Temperature: -20℃～+55℃ (noise below 55DB)

f) Storage Temperature: -30℃～+70℃

2. Relative Humidity

≤93%（40℃）

3. Atmospheric Pressure

Able to function properly under 86-106kPa atmospheric pressure（Altitude≥3000m）

4. Vibration Test

Frequency: 10Hz～55Hz～10Hz, Vibration Amplitude:0.15mm, Sweep Speed≤1 oct/min, Cycle Times:5 times

5. Shock Test

Peak acceleration: 500m/S2, Pulse duration:11ms.

6. Insulation Resistance

The insulation resistance of all separate circuit should meet following requeirements:

a)Relative humidity ≤75%, If environmental temperature between 15～35℃, the value of insulation resistance should ≥20MΩ; Cable insultaion resistance value≥100MΩ.

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Radio disturbance limit meets GB9254 regulation: A level /B level radio disturbance limit.

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Immunity limit lives up to GB/T17618 and meets industrial level testing standards

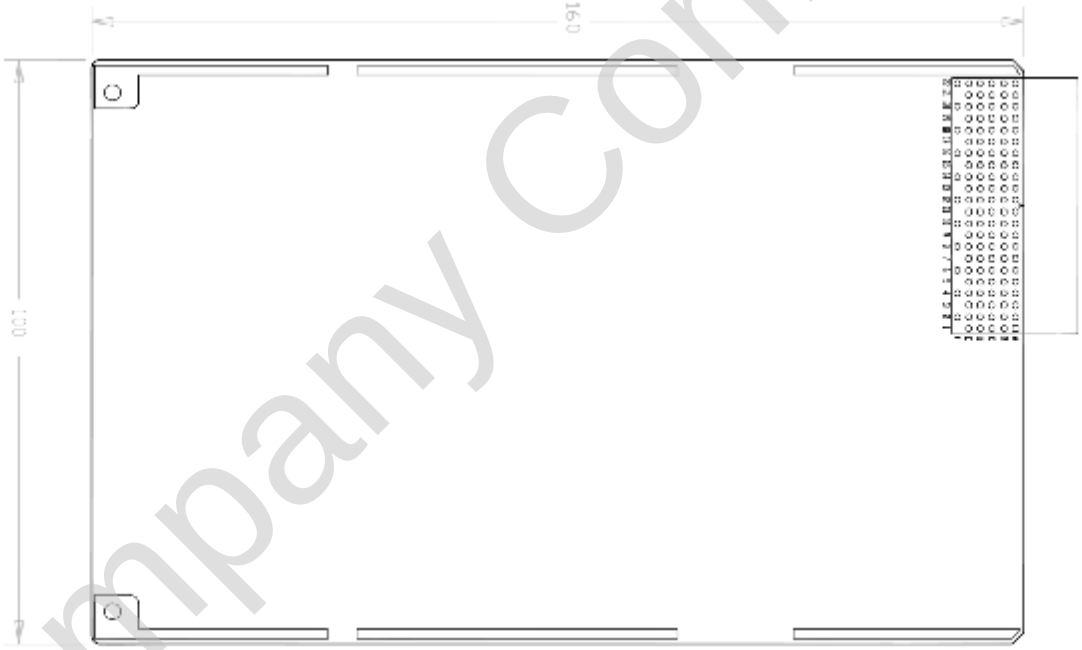
10. Electrostatic Level

6KV contact discharge and 8KV air discharge

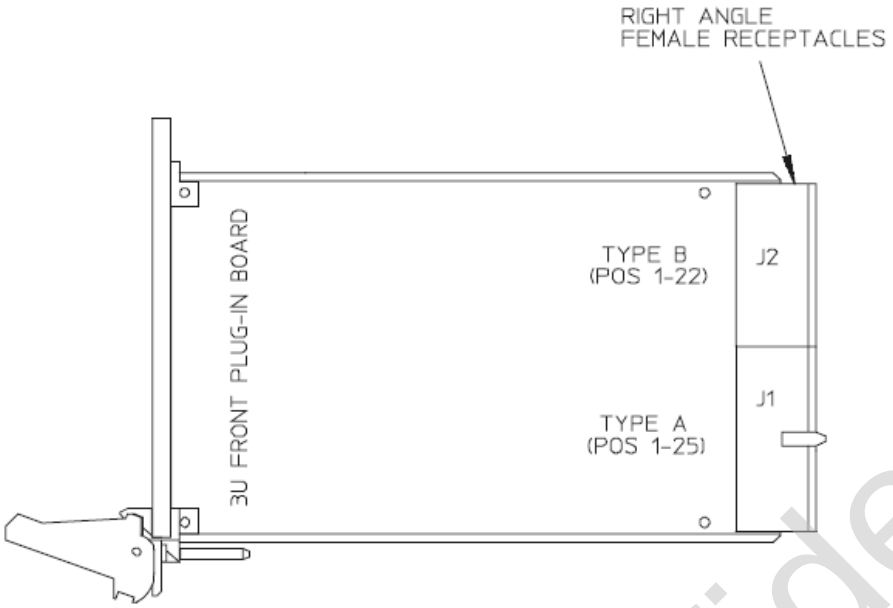
3. Expansion Board Specification

1. Expansion Board Dimendion and connectors Location:

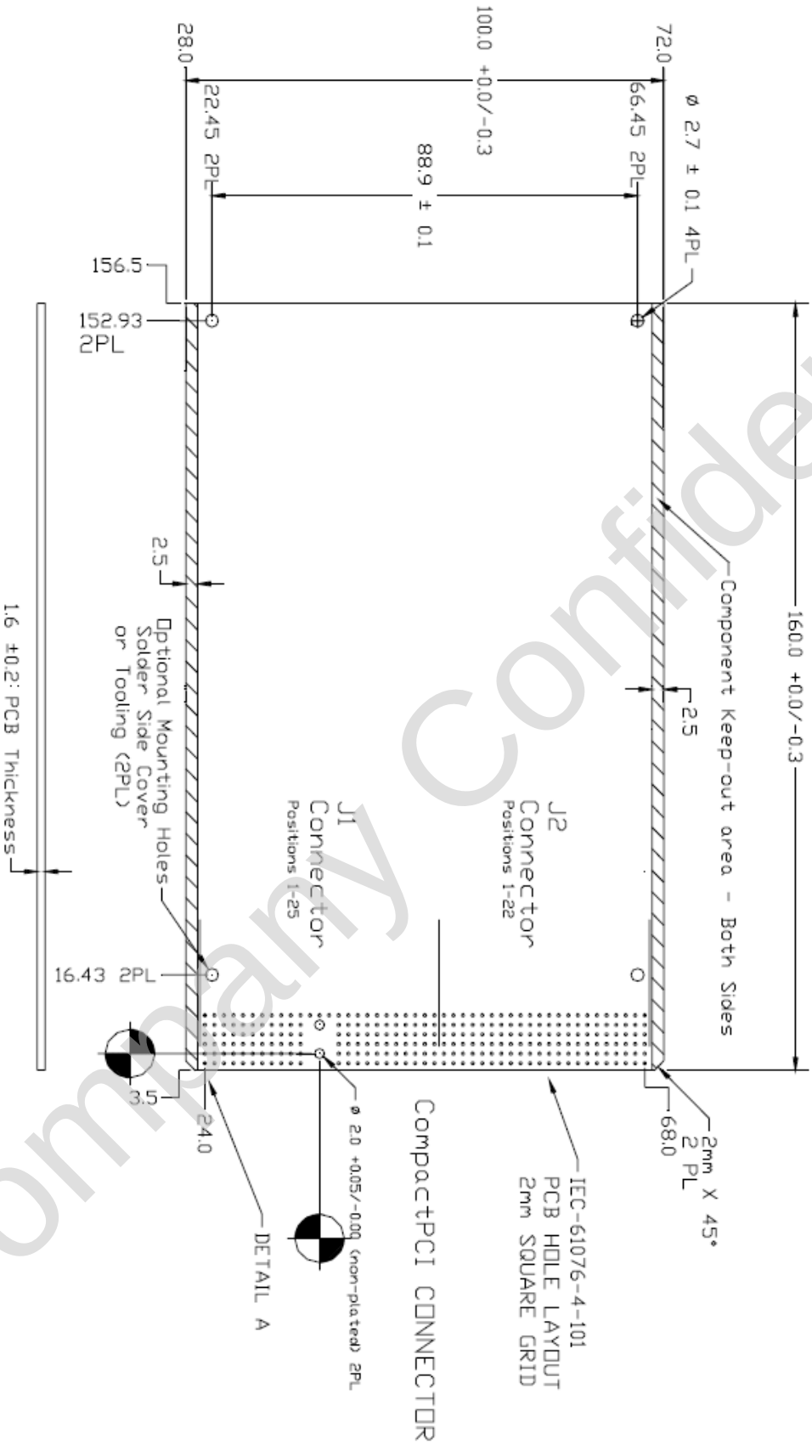
Expansion board only reserves a J2 Connector

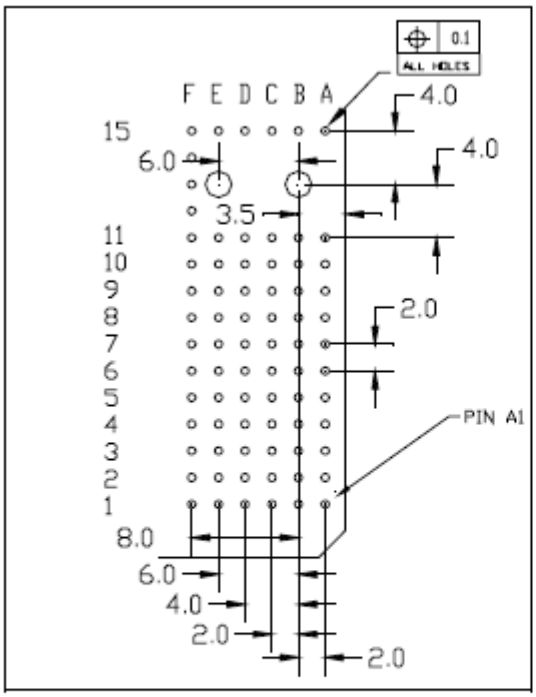


Board Front View



2. Board Interface Definition and Board Thickness:

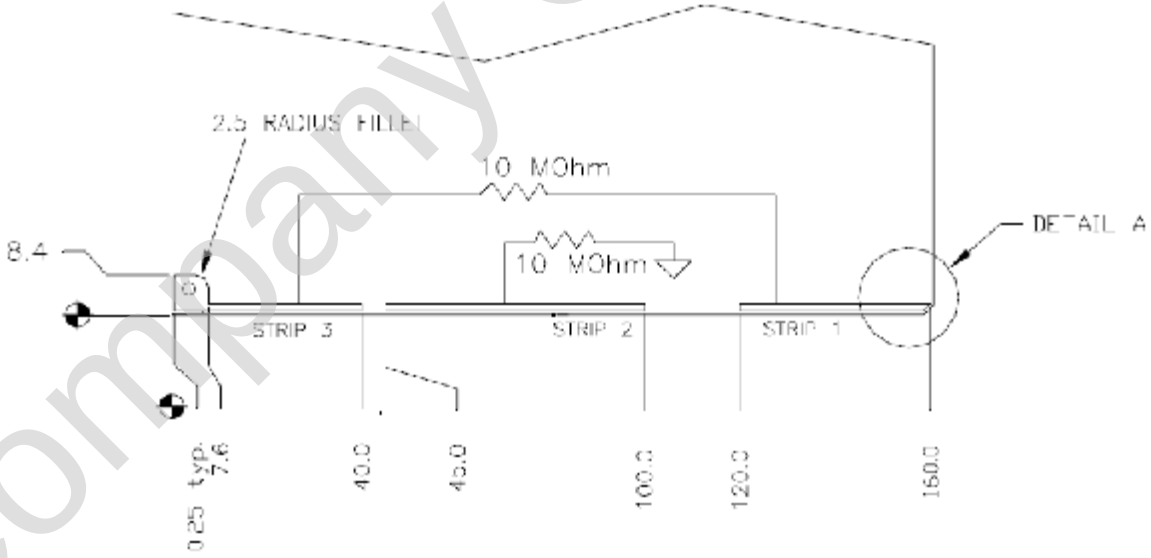


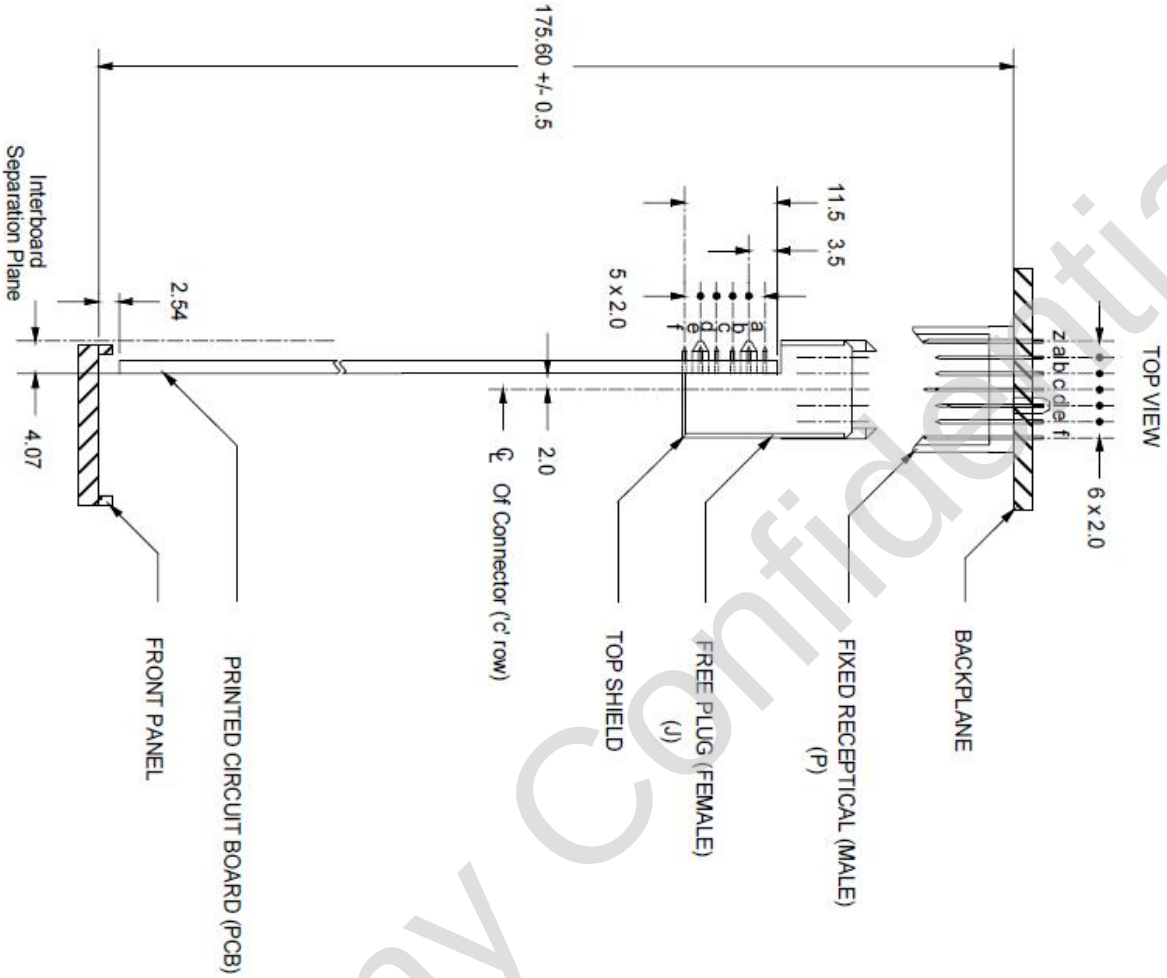


DETAIL A

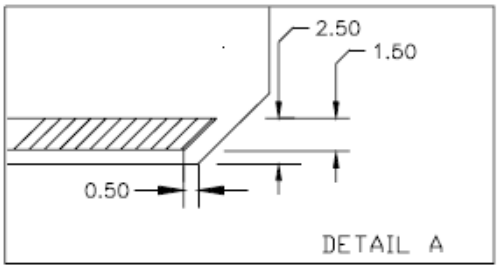
Notes:
Refer to ESD Strip Detail

3. Mounting Holes and ESD STRIP:





NOTES:
1) ESD STRIP LOCATIONS ARE TO BE PROVIDED AT BOTH PRIMARY AND SECONDARY SIDES OF PCB
2) THIS DRAWING APPLIES TO THE BOOTTOM OF 3U AND 6U BOARDS



4. Height of Onboard Modules:

The height of rear panel modules should be lower than 2mm.With the single-slot board, height of the front panel modules shoulbe be lower than 15mm. With dual-slot board, height of the onboard modules should be lower than 35mm. Accordingly, With one more slot, the height will increase by 20mm.

5.Board signal and power define:

POS	ROW Z	ROW A	ROW B	ROW C	ROW D	ROW E	ROW F
22	NP	LINE_R	SPEAKERR_R	AGND	PCIE_WAKE#	PLT_RST#①	GND
21	NP	LINE_L	SPEAKERR_L	AGND			GND
20	NP	AGND	AGND	GND			GND
19	NP	RX		GND	GND	GND	GND
18	NP	TX		GND	LAN1_RX+	LAN1_RX-	GND
17	NP	SMB_DATA		GND	LAN1_TX+	LAN1_TX-	GND
16	NP	SMB_CLK		GND	LAN2_RX+	LAN2_RX-	GND
15	NP	GND	GND	GND	LAN2_TX+	LAN2_TX-	GND
14	NP	SATA_TXP	SATA_TXN	GND	SATA_RXP	SATA_RXN	GND
13	NP	CLK_PCIE_P	CLK_PCIE_N	GND	USB_PP	USB_PN	GND
12	NP	PCIE_TXP	PCIE_TXN	GND	PCIE_RXP	PCIE_RXN	GND
11	NP	PEG_TXP7	PEG_TXN7	GND	PEG_RXP7	PEG_RXN7	GND
10	NP	PEG_TXP6	PEG_TXN6	GND	PEG_RXP6	PEG_RXN6	GND
9	NP	PEG_TXP5	PEG_TXN5	GND	PEG_RXP5	PEG_RXN5	GND
8	NP	PEG_TXP4	PEG_TXN4	GND	PEG_RXP4	PEG_RXN4	GND
7	NP	PEG_TXP3	PEG_TXN3	GND	PEG_RXP3	PEG_RXN3	GND
6	NP	PEG_TXP2	PEG_TXN2	GND	PEG_RXP2	PEG_RXN2	GND
5	NP	PEG_TXP1	PEG_TXN1	GND	PEG_RXP1	PEG_RXN1	GND
4	NP	PEG_TXP0	PEG_TXN0	GND	PEG_RXP0	PEG_RXN0	GND
3	NP	GND	GND	GND	GND	GND	GND
2	NP	-12V	+5V	+5V	+3.3V	+3.3V	GND
1	NP	+12V	+5V	+5V	+3.3V	+3.3V	GND

Yelllow columns represent PCIE signal, in which the ones with black letters represent PCIE x8 signals

White columns with red letters represent PCIE x1 signals

Yellow columns with red letters represent Common PCIE signals. System defaults that PCIE x1 and PCIE x8 can not be used simultaneously

Blue columns with yellow letters represent SATA signal lines

Grey columns with yellow letters represent I2C signal lines

Grey columns with black letters represent COM signal line

Brown letters represent Audio signal

Cyanic letters represent LAN signal

PWR Pin/GND Pin are Common Pin