USER'S MANUAL

PPC-1208F

7" ARM-Based Panel PC
Freescale™ CPU
With Micro-SD/LAN/Audio

PPC-1208F   M3

PPC-1208F Freescale™CPU
7" ARM-Based Panel PC
With Micro-SD/LAN/Audio

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DISCLAIMER

This operation manual is meant to assist both Embedded Computer manufacturers and end users in installing and setting up the system. The information contained in this document is subject to change without any notice.

CE NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC NOTICE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

WARNING! Some internal parts of the system may have high electrical voltage. And therefore we strongly recommend that qualified engineers can open and disassemble the system. The LCD and Touchscreen are easily breakable; please handle them with extra care.

TABLE OF CONTENTS

APPENDIX   A   SYSTEM ASSEMBLY

APPENDIX   B   BLOCK DIAGRAM

INTRODUCTION

This chapter gives you the information for PPC-1208F. It also outlines the System specification.

Section includes:

● About This Manual

● System Specifications

● Safety precautions

Experienced users can skip to chapter 2 on page 2-1 for Quick Start.

1-1. ABOUT THIS MANUAL

Thank you for purchasing PPC-1208F Arm Based Motherboard. PPC-1208F provides faster processing speed, greater expandability and can handle more task than before. This manual is designed to assist you how to install and set up the system. It contains four chapters. The user can apply this manual for configuration according to the following chapters :

Chapter 1 Introduction

This chapter introduces you to the background of this manual, and the specification for this system. The final part of this chapter will indicate you how to avoid damaging this Panel PC.

Chapter 2 Hardware Configuration

This chapter outlines the component location and their functions. In the end of this chapter, you will learn how to set jumper and how to configure this card to meet your own needs.

Chapter 3 Software Utilities

This chapter contains helpful information for proper installations of LAN and Sound utilities.

Appendix A   System Assembly

This section contains exploded diagrams for the whole system unit.

Appendix B   Block Diagram

This section gives you the information about the product application.

1-2. SYSTEM SPECIFICATION

System

CPU Type	Freescale™ ARM Cortex™ A8 i.MX515 800 MHz
PMIC	Freescale™ MC13892JVK
Operation System	Windows® CE 6.0
Memory	Up to 512 MB DDR2 SDRAM on board
Flash	e-NAND 4GB
Panel Protection	IP65 compliant
Power Requirement	DC-in 12V (Optional: wide-ranged 9-36V DC-in)
WDT	Built-in Freescale™ i.MX515 MPU
Construction	Aluminum front bezel/Rugged metal housing
Mounting	ARM (VESA 75 x 75)
System Weight	1.4 kg (3.1lb)
Dimension (WxHxD)	235 x 150 x 41.5 mm (9.25" x 5.9 x 1.6")
Certificate	FCC/CE

I/O Ports

LAN	1 x 10/100 MBps
USB	2 x USB2.0
Serial Port	・ COM 1 for RS232 (+5V/+12V selectable) ・ COM2 for RS485
Audio	1 x Line out
Speaker	1 x 2 W international speaker
Digital I/O	3 in/3 out
Expansion Slot	1 x Micro-SD slot

Display

LCD Size	7"
Brightness (cd/m^2)	500 cd/m^2
Backlight & MTBF	LED, 50,000 hrs
Touch Screen	Resistive type 4-wire

Environment

Operation Temp.	0 ~ 60˚C (32 ~ 140˚F)
Storage Temp.	-20 ~ 80˚C (-4 ~ 176˚F)
Humidity	20 ~ 90 %

1-3. SAFETY PRECAUTIONS

Follow the messages below to avoid your systems from damage:

1. Avoid your system from static electricity on all occasions.

2. Prevent electric shock. Don't touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.

3. Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

HARDWARE CONFIGURATION

** QUICK START **

Helpful information describes the jumper & connector settings, and component locations.

Section includes:

- Jumper & Connector Quick Reference Table

- Component Locations

- Configuration and Jumper settings

- Connector's Pin Assignments

2-1. JUMPER & CONNECTOR QUICK REFERENCE TABLE

| JUMPER / CONNECTOR	NAME
Boot Selection	JP_BOOT1
COIN Connector	CN_COIN1
COM1 Connector	CN_COM1
COM1 RI & Voltage Selection	JP_COM1
COM2 Connector	CN_COM2
DIO Connector	CN_DIO1
FPC Connector	FPC_LCD2
Inverter Connector	CN_INV1
Audio Connector	CN_JACK1
Keypad Connector	CN_KEYPAD1
LAN Connector	CN_LAN1
LCD Connector	TOUCH_LCD2
LVDS Connector	CN_LVDS1
Power Connector	J1
Power LED Connector	CN_PWRLED1
Speaker Connector	CN_SPK1
USB Connector	USB_HS1, CN_USB1
USB OTG Connector	USB_OTG1

2-2. COMPONENT LOCATIONS
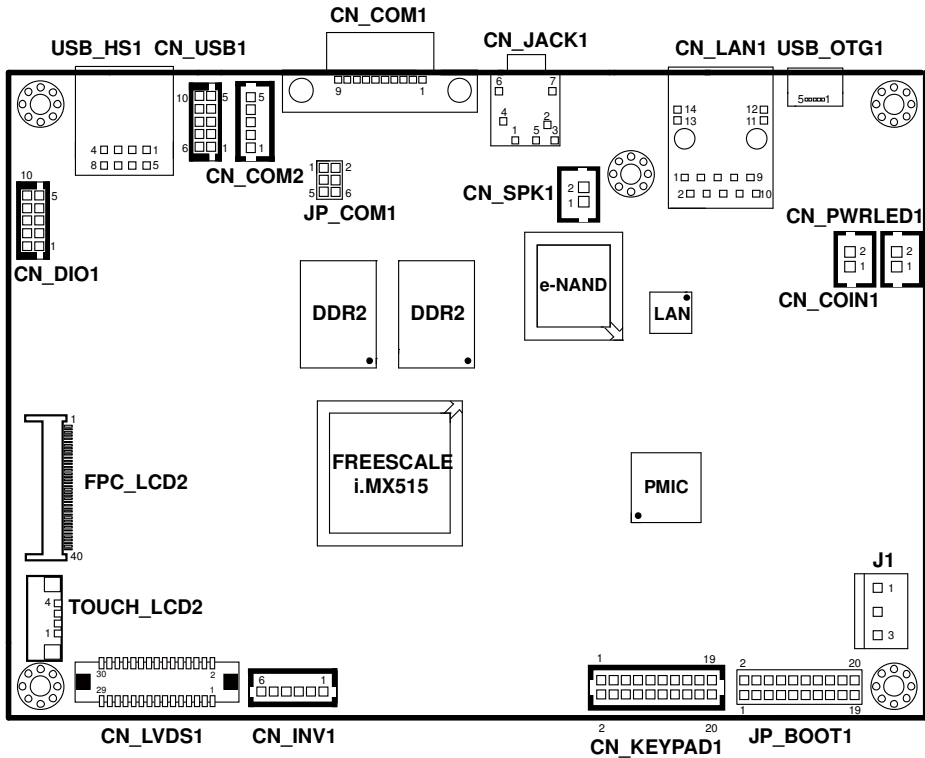
PPC-1208F Connector, Jumper and Component locations

2-3. HOW TO SET THE JUMPERS

You can configure your board by setting jumpers. Jumper is consists of two or three metal pins with a plastic base mounted on the card, and by using a small plastic "cap", Also known as the jumper cap (with a metal contact inside), you are able to connect the pins. So you can set-up your hardware configuration by "open" or "close" pins.

The jumper can be combined into sets that called jumper blocks. When the jumpers are all in the block, you have to put them together to set up the hardware configuration. The figure below shows how this looks like.

JUMPERS AND CAPS

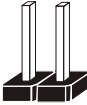| 2 Pin Jumper | 3 Pin Jumper | Jumper Block | Jumper Cap |
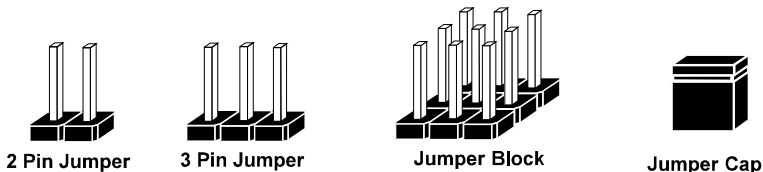
If a jumper has three pins (for examples, labelled PIN1, PIN2, and PIN3), You can connect PIN1 & PIN2 to create one setting and shorting. You can either connect PIN2 & PIN3 to create another setting. The same jumper diagrams are applied all through this manual. The figure below shows what the manual diagrams look and what they represent.
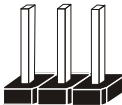
JUMPER DIAGRAMS
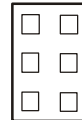
Jumper Cap looks like this

2 pin Jumper looks like this

3 pin Jumper looks like this

Jumper Block looks like this

JUMPER SETTINGS

2 pin Jumper close(enabled) Looks like this

1

3 pin Jumper 2-3 pin close(enabled) Looks like this

1

Jumper Block 1-2 pin close(enabled) Looks like this
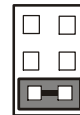
1   2

2-4. BOOT SELECTION

JP_BOOT1: Boot Selection
The selections are as follows:

SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
SPI-NOR	5-6, 7-8, 9-10, 13-14, 15-16	
SD-MMC1	13-14, 15-16	
SD-MMC2	11-12, 13-14, 15-16	
UART-1	1-2, 3-4, 13-14, 15-16	
USB-OTG	1-2, 3-4, 13-14, 15-16	

Note: Manufacturing Default – SD-MMC2

2-5. COIN CONNECTOR

CN_COIN1: COIN Connector
The pin assignments are as follows :

PIN	ASSIGNMENT
1	RTC_BAT
2	GND
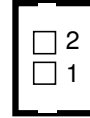
CN_COIN1

2-6. COM1 CONNECTOR

CN_COM1: COM1 Connector
The pin assignments are as follows :

PIN	ASSIGNMENT
1	COM1_DCD
2	COM1_RXD
3	COM1_TXD
4	COM1_DTR
5	GND
6	COM1_DSR
7	COM1_RTS
8	COM1_CTS
9	COM1_RI_SEL
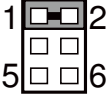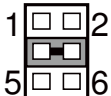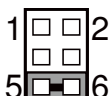
CN_COM1

2-7. COM1 RI & VOLTAGE SELECTION

JP_COM1: COM1 RI & Voltage Selection
The selections are as follows:

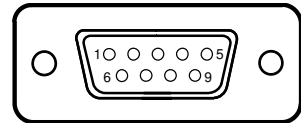| SELECTION	JUMPER SETTINGS	JUMPER ILLUSTRATION
RI	1-2	1 ▢■▢ 2 ▢ ▢ 5 ▢ ▢ 6 **JP_COM1**
5V	3-4	1 ▢ ▢ 2 ■■ 5 ▢ ▢ 6 **JP_COM1**
12V	5-6	1 ▢ ▢ 2 ▢ ▢ 5 ■■ 6 **JP_COM1**

Note: Manufacturing Default – RI

2-8. COM2 CONNECTOR

CN_COM2: COM2 Connector
The pin assignments are as follows :

PIN	ASSIGNMENT
1	COM2_D-
2	COM2_D+
3	GND
4	VCC5
5	GND

CN_COM2

2-9. DIO CONNECTOR

CN_DIO1: DIO Connector
The pin assignments are as follows :

PIN	ASSIGNMENT
1	DIN0
2	DIN1
3	DIN2
4	NC
5	GND
6	DOUT0
7	DOUT1
8	DOUT2
9	VCC5
10	NC

CN_DIO1
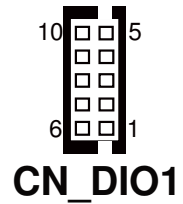
2-10. FPC CONNECTOR

FPC_LCD2: FPC Connector
The pin assignments are as follows :

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	GND	21	3V3_LCD_G5
2	GND	22	3V3_LCD_G4
3	LCD2_ADJ	23	3V3_LCD_G3
4	VCC5_BKLT	24	GND
5	VCC5_BKLT	25	3V3_LCD_G2
6	VCC5_BKLT	26	3V3_LCD_G1
7	3V3_LCD2_MAIN	27	3V3_LCD_G0
8	3V3_LCD2_MAIN	28	GND
9	3V3_DE	29	3V3_LCD_R4
10	GND	30	3V3_LCD_R3
11	GND	31	3V3_LCD_R2
12	GND	32	GND
13	3V3_LCD_B4	33	3V3_LCD_R1
14	3V3_LCD_B3	34	3V3_LCD_R0
15	3V3_LCD_B2	35	3V3_LCD_R4
16	GND	36	GND
17	3V3_LCD_B1	37	GND
18	3V3_LCD_B0	38	3V3_LCD_CLK
19	3V3_LCD_B4	39	GND
20	GND	40	GND

1

40

FPC_LCD2
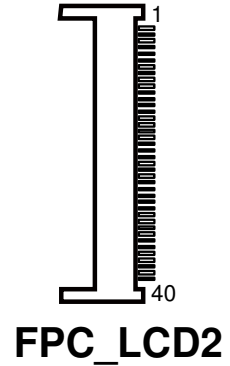
2-11. INVERTER CONNECTOR

CN_INV1: Inverter Connector
The pin assignments are as follows :

PIN	ASSIGNMENT
1	VCC12
2	VCC12
3	GND
4	BRCTR
5	GND
6	3V3_LVDS_BKLTEN

CN_INV1

2-12. AUDIO CONNECTOR

CN_JACK1: Audio Connector
The pin assignments are as follows :

PIN	ASSIGNMENT
1	NC
2	HP_DET_L
3	GND
4	HPOUT_L
5	HPOUT_R
6	MIC_IN_HP
7	GND_JACK

CN_JACK1
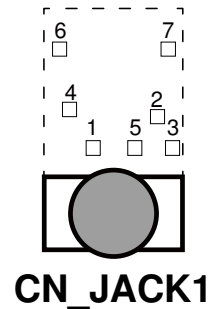
2-13. KEYPAD CONNECTOR

CN_KEYPAD1: Keypad Connector
The pin assignments are as follows:
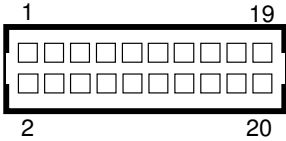
CN_KEYPAD1

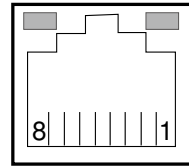| PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	KEY_COL0	11	KEY_COL5
2	KEY_ROW0	12	KEY_ROW5
3	KEY_COL1	13	NC
4	KEY_ROW1	14	KEY_ROW6
5	KEY_COL2	15	NC
6	KEY_ROW2	16	KEY_ROW7
7	KEY_COL3	17	GND
8	KEY_ROW3	18	GND
9	KEY_COL4	19	2V775_KEY
10	KEY_ROW4	20	2V775_KEY

2-14. LAN CONNECTOR

CN_LAN1: LAN Connector
The pin assignments are as follows :

CN_LAN1: LAN Connector
The pin assignments are as follows :

PIN	ASSIGNMENT
1	TX+
2	TX
3	NC
4	NC
5	RX+
6	RX
7	NC
8	NC

LAN1

2-15. LCD CONNECTOR

TOUCH_LCD2: LCD Connector
The pin assignments are as follows :

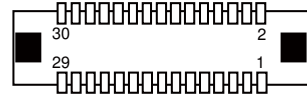| PIN	ASSIGNMENT
1	LCD2_Y-
2	LCD2_X+
3	LCD2_Y+
4	LCD2_X-
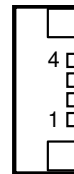
TOUCH_LCD2

2-16. LVDS CONNECTOR

CN_LVDS1: LVDS Connector
The pin assignments are as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	3V3_LVDS	16	LVDS_CLK_P
2	GND	17	LVDS_CLK_N
3	NC	18	GND
4	NC	19	LVDS_TX2_P
5	GND	20	LVDS_TX2_N
6	NC	21	GND
7	NC	22	LVDS_TX1_P
8	GND	23	LVDS_TX1_N
9	NC	24	GND
10	NC	25	LVDS_TX0_P
11	NC	26	LVDS_TX0_N
12	NC	27	LVDS_TX3_P
13	NC	28	LVDS_TX3_N
14	NC	29	3V3_LVDS
15	GND	30	3V3_LVDS

LVDS1

2-17. POWER CONNECTOR

J1: Power Connector
The pin assignments are as follows :

PIN	ASSIGNMENT
1	12V_IN
2	GND
3	GND

J1
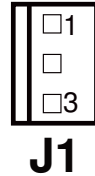
2-18. POWER LED CONNECTOR

CN_PWRLD1: Power LED Connector
The pin assignments are as follows :
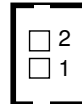
PIN	ASSIGNMENT
1	VCC5_IN
2	GND

CN_PWRLED1

2-19.SPEAKER CONNECTOR

CN_SPK1: Power LED Connector
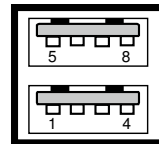The pin assignments are as follows :

PIN	ASSIGNMENT
1	SPK_L
2	SPK_R

CN_SPK1

2-20. USB CONNECTOR

USB_HS1: USB Connector
The pin assignments are as follows :

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5_USB1	5	VCC5_USB2
2	USBDN_DM1	6	USBDN_DM2
3	USBDN_DP1	7	USBDN_DP2
4	GND	8	GND

USB_HS1

CN_USB1: USB Connector
The pin assignment is as follows:

PIN	ASSIGNMENT	PIN	ASSIGNMENT
1	VCC5_USB3	6	VCC5_USB4
2	USB_DM3	7	USB_DM4
3	USB_DP3	8	USB_DP4
4	GND	9	GND
5	GND	10	GND
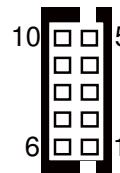
CN_USB1

2-21. USB OTG CONNECTOR

USB_OTG1: USB OTG Connector
The pin assignment is as follows:

PIN	ASSIGNMENT
1	VBUS_OTG
2	USBOTG_DM
3	USBOTG_DP
4	USBOTG_ID
5	GND

USB_OTG1

SOFTWARE UTILITIES

This chapter comprises the detailed information of O.S. image Flashing.

Section includes:

- Image Update (for Windows® CE 6.0 only)

- Application Programming Digital I/O (for Windows® CE 6.0 only)

3-1. IMAGE UPDATE

Update image with **Micro-SD card** and follow the steps below.

1.   Format Micro-SD card to FAT32.
2.   To update WinCE OS, rename the image file to "NK.nb0" and copy it to Micro-SD Card.
3.   To update boot-loader, rename the image file to "eboot.nb0" and copy it to Micro-SD Card.
4.   Insert the Micro-SD Card into PPC-1208F and turn on power.
5.   Boot-loader will update image automatically at the same time.

3-2. APPLICATION PROGRAMMING DIGITAL I/O

You can call the Windows API to do the following:

1.   Define the following for DWORD dwIoControlCode

     #define ESCAPECODEBASE   100000
     #define IOCTL_DIO_SETBIT   (ESCAPECODEBASE + 20)
     #define IOCTL_DIO_GETBIT   (ESCAPECODEBASE + 23)

2.   Open Digital IO port

     CreateFile (LPCWSTR lpFileName,
     DWORD dwDesiredAccess,
     DWORD dwShareMode,
     LPSECURITY_ATTRIBUTES lpSecurityAttributes,
     DWORD dwCreationDisposition,
     DWORD dwFlagsAndAttributes,
     HANDLE hTemplateFile);**--->**to open DIO port

     Ex. CreateFile(TEXT("DIO1:"),GENERIC_READ | GENERIC_WRITE,0,
     NULL,OPEN_EXISTING,0,0);

3.   Set DOUT value

DeviceIoControl (HANDLE hDevice,
DWORD dwIoControlCode,
LPVOID lpInBuf,
DWORD nInBufSize,
LPVOID lpOutBuf,
DWORD nOutBufSize,
LPDWORD lpBytesReturned,
LPOVERLAPPED lpOverlapped);**--->** ioctrl DOUT

Ex.   DeviceIoControl(hFile, IOCTL_DIO_SETBIT, NULL, 0, &value, 1,
NULL, NULL);

4.   Get DIN value

DeviceIoControl (HANDLE hDevice,
DWORD dwIoControlCode,
LPVOID lpInBuf,
DWORD nInBufSize,
LPVOID lpOutBuf,
DWORD nOutBufSize,
LPDWORD lpBytesReturned,
LPOVERLAPPED lpOverlapped);→ ioctrl DIN

Ex.   DeviceIoControl(hFile, IOCTL_DIO_GETBIT, NULL, 0, &value, 1,
NULL, NULL);

SYSTEM ASSEMBLY
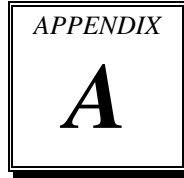
This appendix contains exploded diagrams and part numbers of the PPC-1208F system.

Sections included:

- Exploded Diagram for PPC-1208F Panel Holder

- Exploded Diagram for PPC-1208F Panel Holder Module

- Exploded Diagram for PPC-1208F Main Board

- Exploded Diagram for PPC-1208F Cable Module

- Exploded Diagram for PPC-1208F I/O Port Module

- Exploded Diagram for PPC-1208F Rear Plate

- Exploded Diagram for PPC-1208F Front Cover

- Exploded Diagram for PPC-1208F SD Card Cover

EXPLODED DIAGRAM FOR PPC-1208F PANEL HOLDER
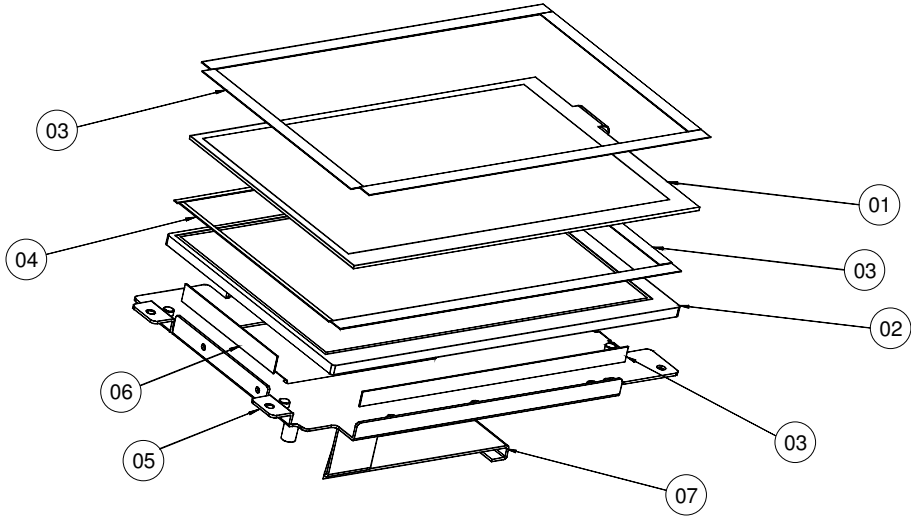
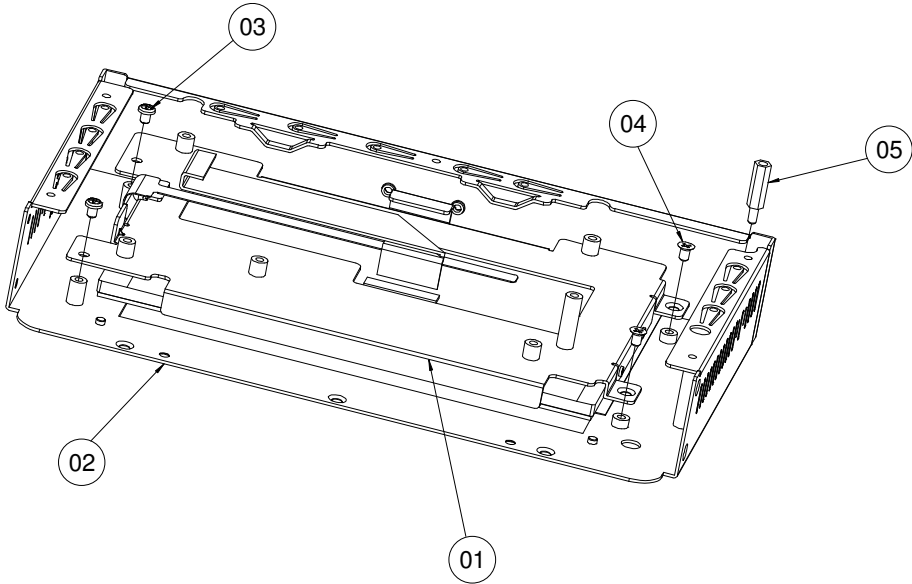| NO	Part Name	Part No.	Qty
1	7" Touch Panel,4-Wire Resitive type	52-380-08407007	1
2	7" TFT LCD Panel(LED Backlight)	52-351-11804831	1
3	PORON 165x6 T=0.5mm	30-013-24200073	7
4	PORON 165x2 T=0.5mm	30-013-24100073	2
5	SP-6007 PANEL HOLDER	20-029-03001223	1
6	PORON 56x6 T=0.5mm	90-013-24100246	1
7	FPC CABLE Pitch=0.5mm Pin=40 L=250mm	27-000-11205092	1

EXPLODED DIAGRAM FOR PPC-1208F PANEL HOLDER MODULE

SP-6007RA-E0B & SP-6007RA-F0B
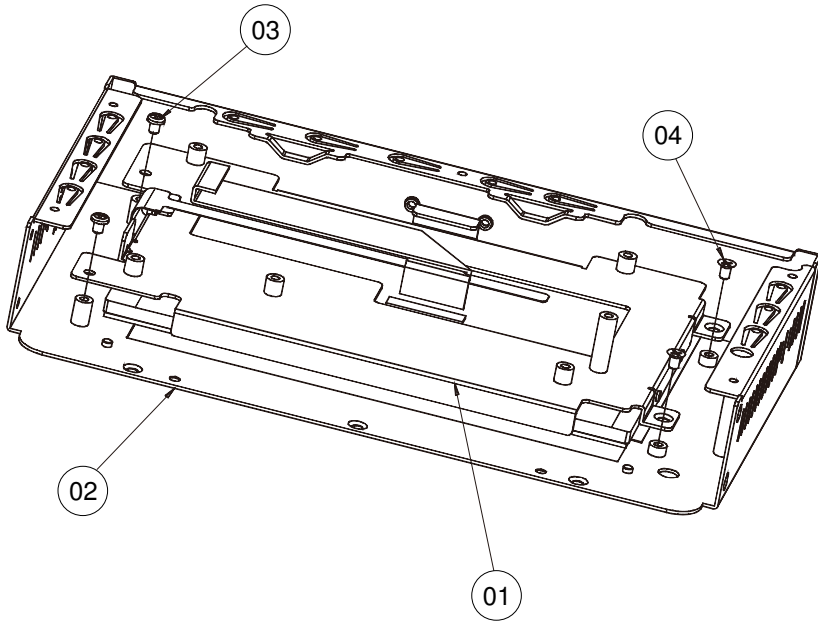
NO	Part Name	Part No.	Qty
1	PANEL HOLDER MODULE	---------------	1
2	PANEL COVER(Black)	20-004-03061223	1
3	ROUND HEAD SCREW M3x0.5Px5mm	22-230-30005811	2
4	FLAT HEAD SCREW M3x0.5Px4mm	22-212-30004311	2

SP-6007RA-E1B & SP-6007RA-F1B

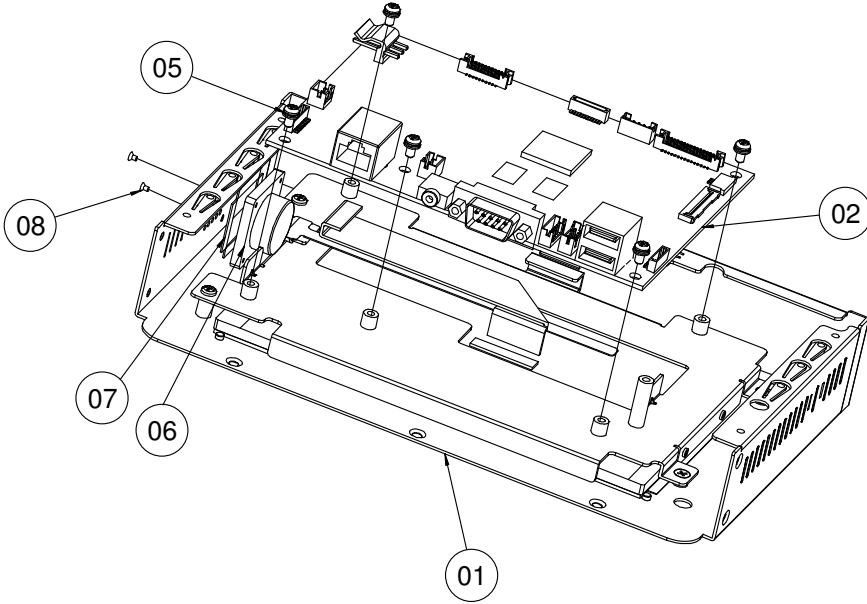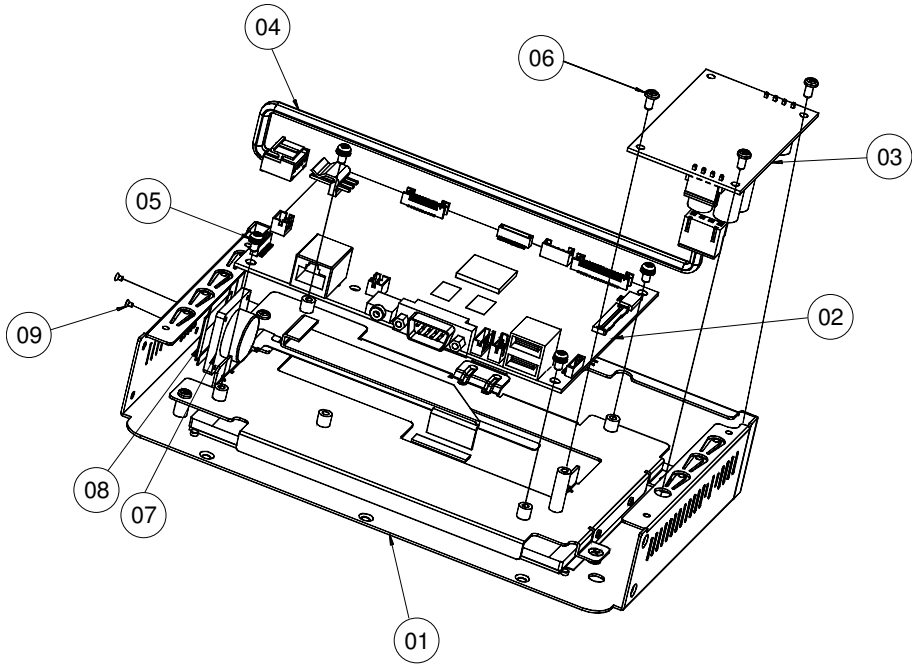| NO	Part Name	Part No.	Qty
1	PANEL HOLDER MODULE	---------------	1
2	PANEL COVER(Black)	20-004-03061223	1
3	ROUND HEAD SCREW M3x0.5Px5mm	22-230-30005811	2
4	FLAT HEAD SCREW M3x0.5Px4mm	22-212-30004311	2
5	HEX CU BOSS,M3x0.5Px6L,H=15mm	22-290-30015051	1

EXPLODED DIAGRAM FOR PPC-1208F MAIN BOARD

SP-6007RA-E0B & SP-6007RA-F0B

NO	Part Name	Part No.	Qty
1	PANEL_COVER_MODULE	----------------	1
2	EF-51LF MAIN BOARD	----------------	1
5	RW HEAD SCREWM3x0.5Px5mm	22-242-30005311	5
6	PPC-1207 Speaker,28X28X11.2mm	13-500-08280318	1
7	PA-6151 EVA SPONGE	90-013-15200226	4
8	FLAT HEAD SCREW,T2.0x5mm(Black)	22-115-20005014	2

SP-6007RA-E1B & SP-6007RA-F1B

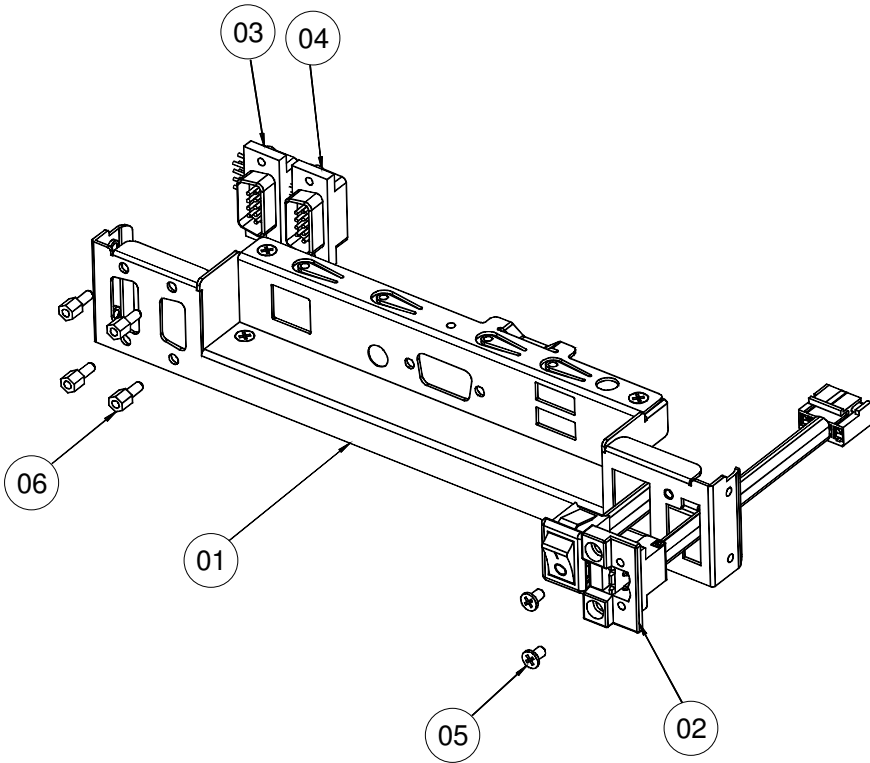| NO	Part Name	Part No.	Qty
1	PANEL_COVER_MODULE	---------------	1
2	EF-51LF MAIN BOARD	---------------	1
3	PAC-S8100LF-D3-G0A	---------------	1
4	SP-6007 POWER OUT CABLE	27-012-22305071	1
5	RW HEAD SCREWM3x0.5Px5mm	22-242-30005311	5
6	ROUND HEAD SCREW,M3x0.5Px5mm	22-230-30005811	3
7	PPC-1207 Speaker,28X28X11.2mm	13-500-08280318	1
8	PA-6151 EVA SPONGE	90-013-15200226	4
9	FLAT HEAD SCREW,T2.0x5mm(Black)	22-115-20005014	2

# EXPLODED DIAGRAM FOR PPC-1208F CABLE MODULE

SP-6007RA-E0B & SP-6007RA-F0B

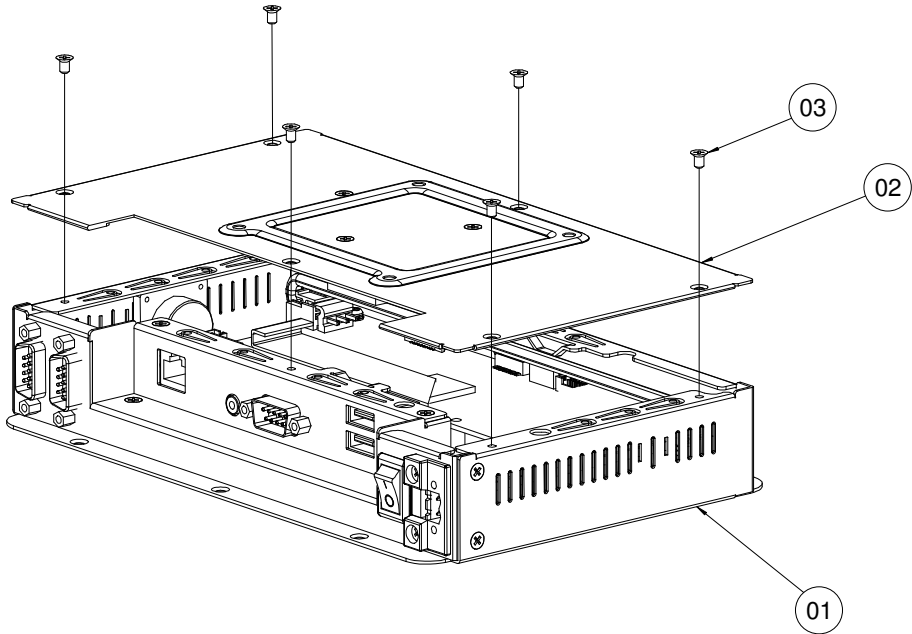| N○	Part Name	Part No.	Qty
1	I○ P○RT PLATE M○DULE	20-005-03061223	1
2	SP-6007 P○WER CABLE(DC-IN)	27-012-22307111	1
3	SP-6007 RS-422 CABLE	27-024-22304031	1
4	SP-6007 DI○ CABLE	27-024-22304032	1
5	R○UND HEAD SCREW,M3x0.5Px5mm	22-230-30005811	2
6	HEX CU B○SS UNC No.4-40,L=4.8,H=7mm	22-692-40048051	4

SP-6007RA-E1B & SP-6007RA-F1B
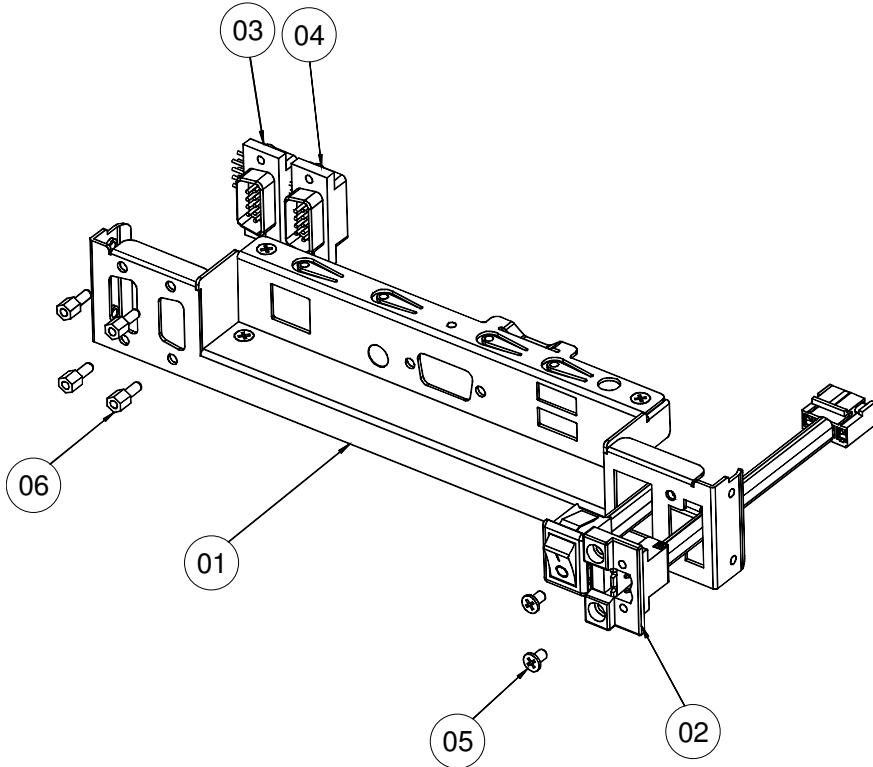
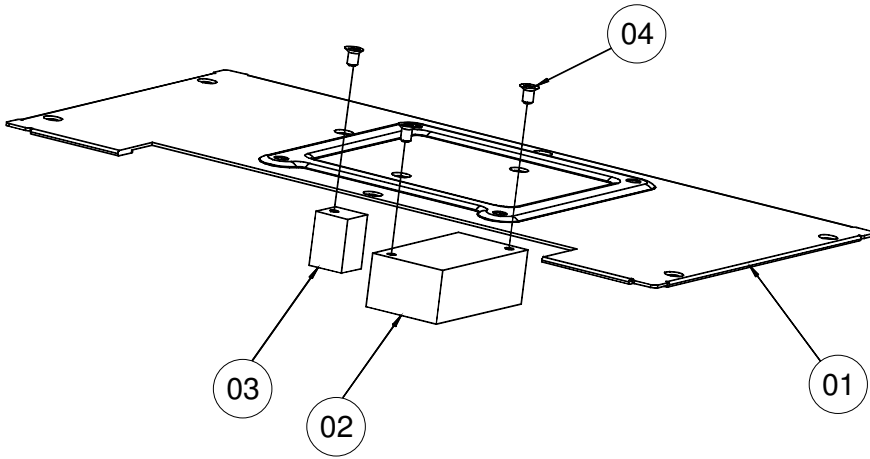| NO	Part Name	Part No.	Qty
1	IO PORT PLATE MODULE	20-005-03061223	1
2	SP-6007 POWER CABLE(DC-IN)	27-012-22301111	1
3	SP-6007 RS-422 CABLE	27-024-22304031	1
4	SP-6007 DIO CABLE	27-024-22304032	1
5	I-HEAD SCREW(BLACK) M3x0.5Px6mm	82-275-30006018	2
6	HEX CU BOSS UNC No.4-40,L=4.8,H=7mm	22-692-40048051	4

EXPLODED DIAGRAM FOR PPC-1208F I/O PORT MODULE
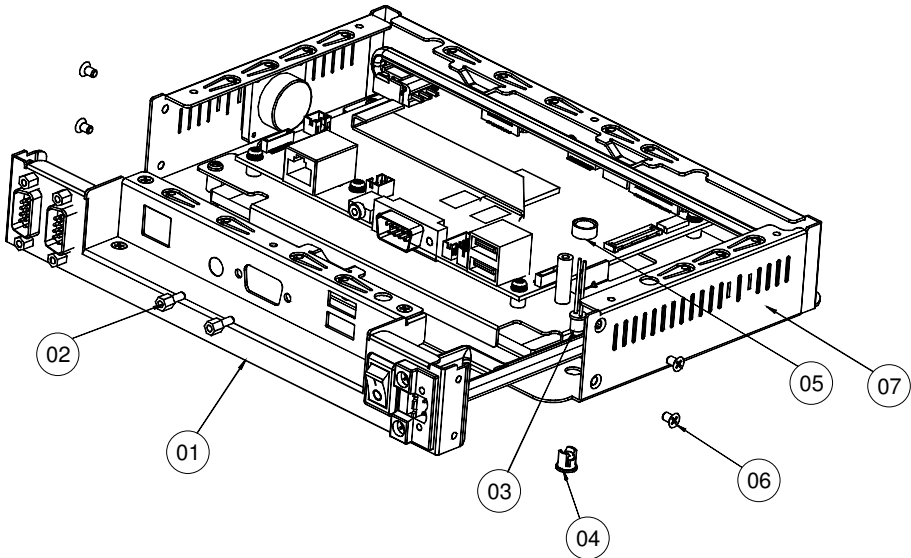
NO	Part Name	Part No.	Qty
1	IO_PORT_MODULE	----------------	1
2	HEX CU BOSS,UNC No.4-40	22-692-40048051	2
3	SP-6007 POWER LED CABLE	27-018-22305071	1
4	LED HOUSING	30-014-04100009	1
5	LED MOUNT (UW-1S)	30-059-04100040	1
6	FLAT HEAD SCREW,M3x0.5Px5mm	22-212-30004311	4
7	PANEL_COVER_MODULE	----------------	1

EXPLODED DIAGRAM FOR PPC-1208F REAR PLATE

NO	Part Name	Part No.	Qty
1	SP-6007 MAIN_MODULE	---------------	1
2	BACK_PLATE_MODULE	---------------	1
3	FLAT HEAD SCREW,M3x0.5Px5mm(Black)	22-215-30005111	6

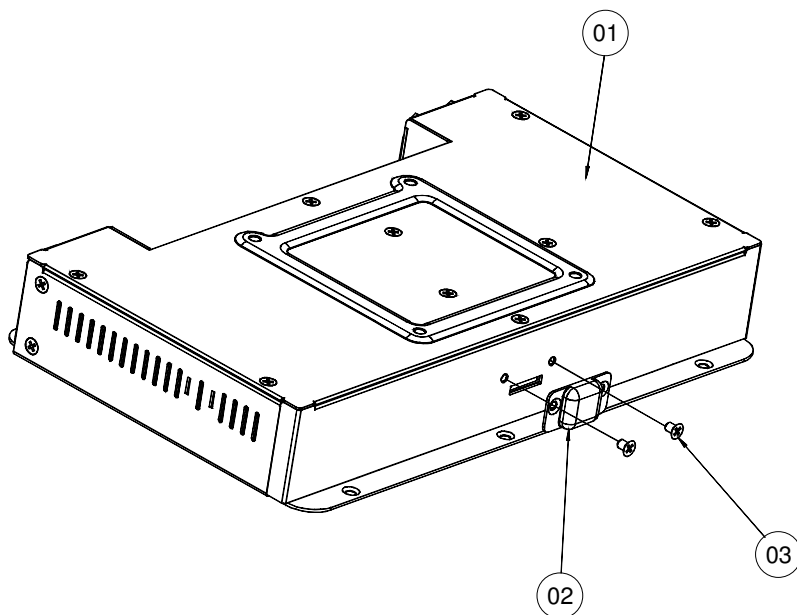| NO	Part Name	Part No.	Qty
1	SP-6007 BACK PLATE	20-005-03062223	1
2	HEAT SINK FOR CPU BLOCK	21-002-14824001	1
3	HEAT SINK FOR POWER BLOCK	21-002-11111003	1
4	FLAT HEAD SCREW,M3x0.5Px5mm(Black)	22-215-30005111	3

EXPLODED DIAGRAM FOR PPC-1208F FRONT COVER

SP-6007RA-F0B & SP-6007RA-F1B only
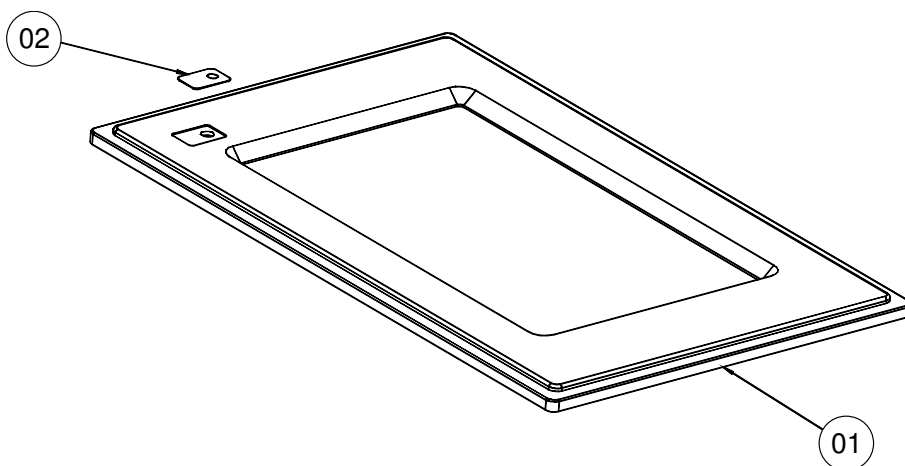
NO	Part Name	Part No.	Qty
1	PPC-1208 FRONT COVER(Black)	20-003-01091246	1
2	LED LABEL FOR POWER	34-017-02103009	1

# EXPLODED DIAGRAM FOR PPC-1208F SD CARD COVER

SP-6007RA-E0B & SP-6007RA-E1B

NO	Part Name	Part No.	Qty
1	SP-6007_MAIN_MODULE	---------------	1
2	PPC-1208 SD CARD COVER(Black)	20-004-03062223	1
3	FLAT HEAD SCREW,M3x0.5Px4mm(Black)	22-215-30004111	2

SP-6007RA-F0B & SP-6007RA-F1B
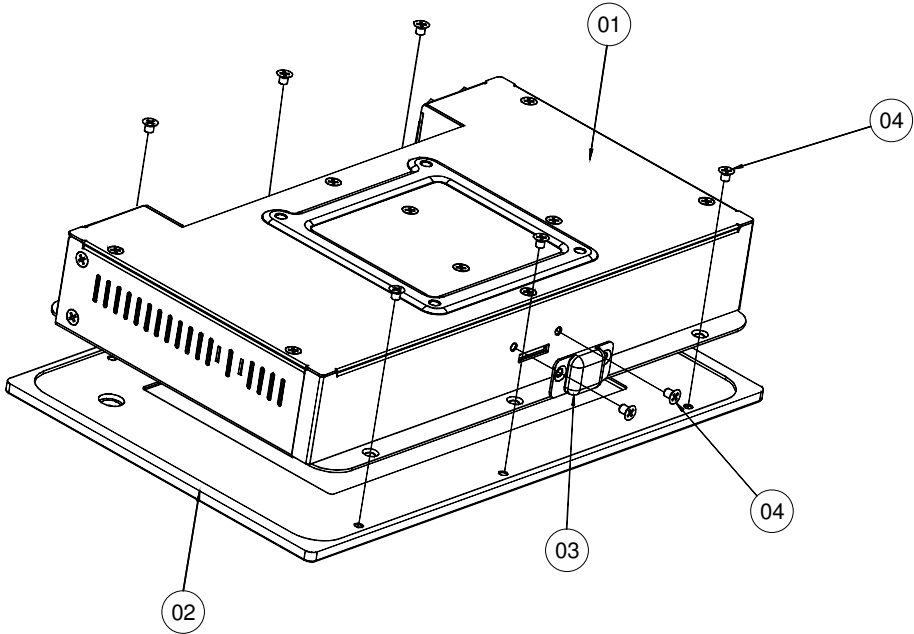
N０	Part Name	Part No.	Qty
1	SP-6007_MAIN_MODULE	---------------	1
2	FRONT_COVER_MODULE	---------------	1
3	PPC-1208 SD CARD COVER(Black)	20-004-03062223	1
4	FLAT HEAD SCREW,M3x0.5Px4mm(Black)	22-215-30004011	8

BLOCK DIAGRAM
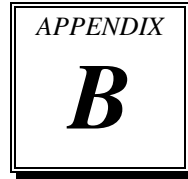
This section introduce you the product function concisely.

Section includes:

● Block Diagram

BLOCK DIAGRAM