Avalue Technology

2009

EPS-910 Sales Kit
Fanless Intel® 910GMLE Rugged Micro PC

Embedded Platform Division
August 2009

avalue

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Agenda

- **Introduction**
- **Why Rugged ?**
- **Why EPS-910 Series ?**
- **EPS-910 Function Diagram**
- **Ordering Information**
- **Marketing Materials**

EPS-910 Fanless Intel® 910GMLE Rugged Micro PC

Overview :

- **EPS-910 RUGGED series :**

  means Robust, High Reliability Design, Rigorous Testing

- **Anti-shock & Anti-Vibration:**

  to fulfill harsh environment usage, such as automation, heavy vehicle...etc.

- **Mobile Expansion – Express Card Slot / 34mm**

  to integrate Wireless LAN (802.11 b/g, WiFi)
  and Wireless Broadband Internet (3G, CDMA, EVDO, GPRS, UMTS, etc.)

- **Great Thermal Design**

  to meet the harsh environment demands.

- **Focus Market:**
  - Industrial Automation
  - Factory & Utility Management
  - Transportation
  - Outdoor Kiosk
  - Heavy Vehicle
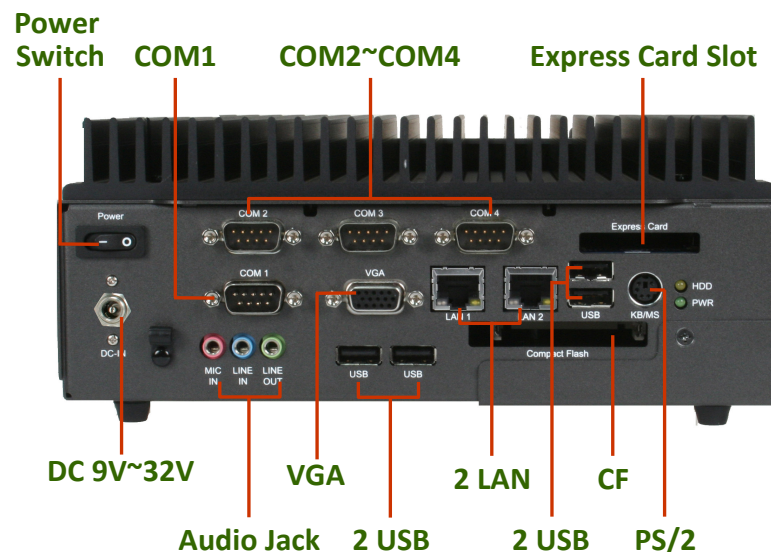
EPS-910 Fanless Intel® 910GMLE Rugged Micro PC

Fanless	2 GbE	4 COM	6 USB	CF	Express Card	SATA
9V~32V	-15~55C	Anti-Vibration	Anti-Shock	Wall Mount		

Features :

- Intel® Celeron® M 600 MHz with 512K L2 Cache CPU
- Intel® 910GMLE / ICH6-M Chipset
- One 200-pin DDR2 SODIMM, up to 2 GB DDR2 400 SDRAM
- Dual Gigabit Ethernet, 2.5" SATA HDD
- Rich I/Os: 4 COM, 6 USB, Line-in/Line-out/Microphone-in
- Expandability: CF Card Slot & Express card / 34mm
- Fanless Operation, Wide temperature operation: -15 ~ 55C
- Wide Range DC Power Input: 9~32V, Optional. Phoenix Type Conn
- Rugged Design for Vibration / Shock Protection

Power Switch   COM1   COM2~COM4   Express Card Slot

2 USB

DC 9V~32V   VGA   2 LAN   CF

Audio Jack   2 USB   2 USB   PS/2

System Specification :
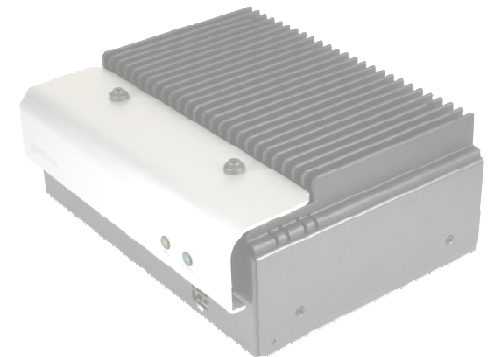
■ System :

Processor	: Intel® Celeron® M 600 MHz with 512K L2 Cache CPU
BIOS	: Award 4 MB Flash BIOS
Memory	: One 200-pin DDR2 SODIMM, up to 2 GB DDR2 400
Chipset	: Intel® 910GMLE / ICH6-M
SSD	: One CompactFlash Type I/II socket with ejector
Display	: 1 x VGA, Intel® 910GMLE GMCH integrated
Audio	: Realtek ALC655 supports 2-CH Audio
Ethernet	: Dual Atheros AR8121 Gigabit Ethernet
Expansion	: 1 Express Card / 34mm slot

■ External I/Os :

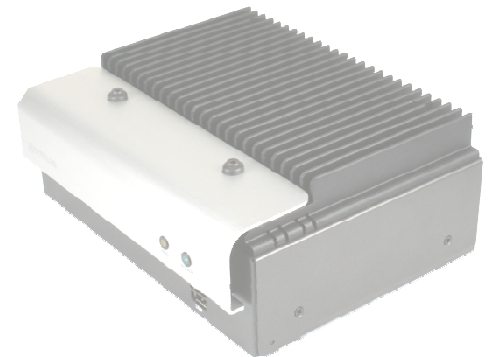|	
Serial Port	: 4 x RS-232 (COM2, supports RS-232/422/485 by BIOS)
LAN Port	: 2 x RJ-45
Display	: 1 x D-sub 15 VGA
Audio	: 1 x Line-in / Line-out / Microphone-in
USB	: 6 x USB 2.0 (Front : 2; Rear : 4)

■ Environment & Mechanical :

Power Input	: +9 ~ +32V
Operating Temp.	: -15 ~ 55C
Storage Temp.	: -40 ~ 75C
Dimension	: 220 mm x 160 mm x 80mm

Why Rugged?

- **A rugged computing is a computer specifically designed to reliably operate in harsh usage environments and conditions, such as**

  – **Drops and shocks**

  – **Strong vibrations**

  – **Extreme temperatures**

  – **Wide Voltage Range Power input**

- **Rugged Embedded System : EPS-910**

  – **Aluminum housing with Fanless solution** *(No ventilation hole)*

  – **Anti-Shock Std according to IEC60068-2-27**

    - **CF : 50G ; HDD : 20G**

  – **Anti-Vibration Std according to IEC60068-2-64**

    - **CF : 5G ; HDD : 1G**

  – **Operation Temperature:**

    - **-15 C to 55 C**

  – **Wide Range DC Power Input**

    - **9V ~ 32V DC acceptable**

What's vibration & Shock?

- ## Vibration : IEC60068-2-64
  - The object of Vibration Test is to identify the possible damage of products in vibration conditions beforehand for manufacturers to make some improvement and provide adequate protection for their products before putting them on market, ensuring that products will not be damaged due to vibration during normal transportation and operational use.

Frequency	General Description
5-55Hz	General road surface vibration
5-200Hz	General land transportation
5-500Hz	**General land transportation + operation environment**
5-2000Hz	Internal high-frequency vibration or components used in avionics

Acceleration -
* HDD : 1 Grms
* CF : 5 Grms
Frequency – 5~500 Hz

- ## Shock : IEC60068-2-27
  - The mechanical impact of consumers products are usually under two conditions: one is during transportation when the vehicle is on a rough road and bumping around or loose cargo, or when the product is dropped during handling. For embedded system usage, sometimes will be installed on automobiles then its environment is worse than normal. Therefore, when a product in the designing state, mechanical shock testing play a critical role of understanding the structure of the product and packing absorption issue.

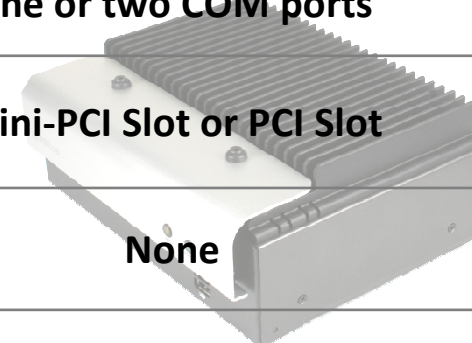| Peak Acceleration (g's)	Pulse Duration (ms)	General Description
15 (Square Wave)	11	Fundamental intensity and structural safety evaluation
30	18/11/6	Overall structural evaluation: transportation in good road surface or with good design of protection
50	11/3	Pier transportation by crane, forklift or transportation by train, truck.
100	11/6	Uneven road surface, aviation anti-shock (turbulence), gift box
500	1	Integrated circuit, micro-structural components/module
1500	1	Integrated circuit, micro-structural components/module

Acceleration -
*HDD : 20 Grms
*CF : 50 Grms
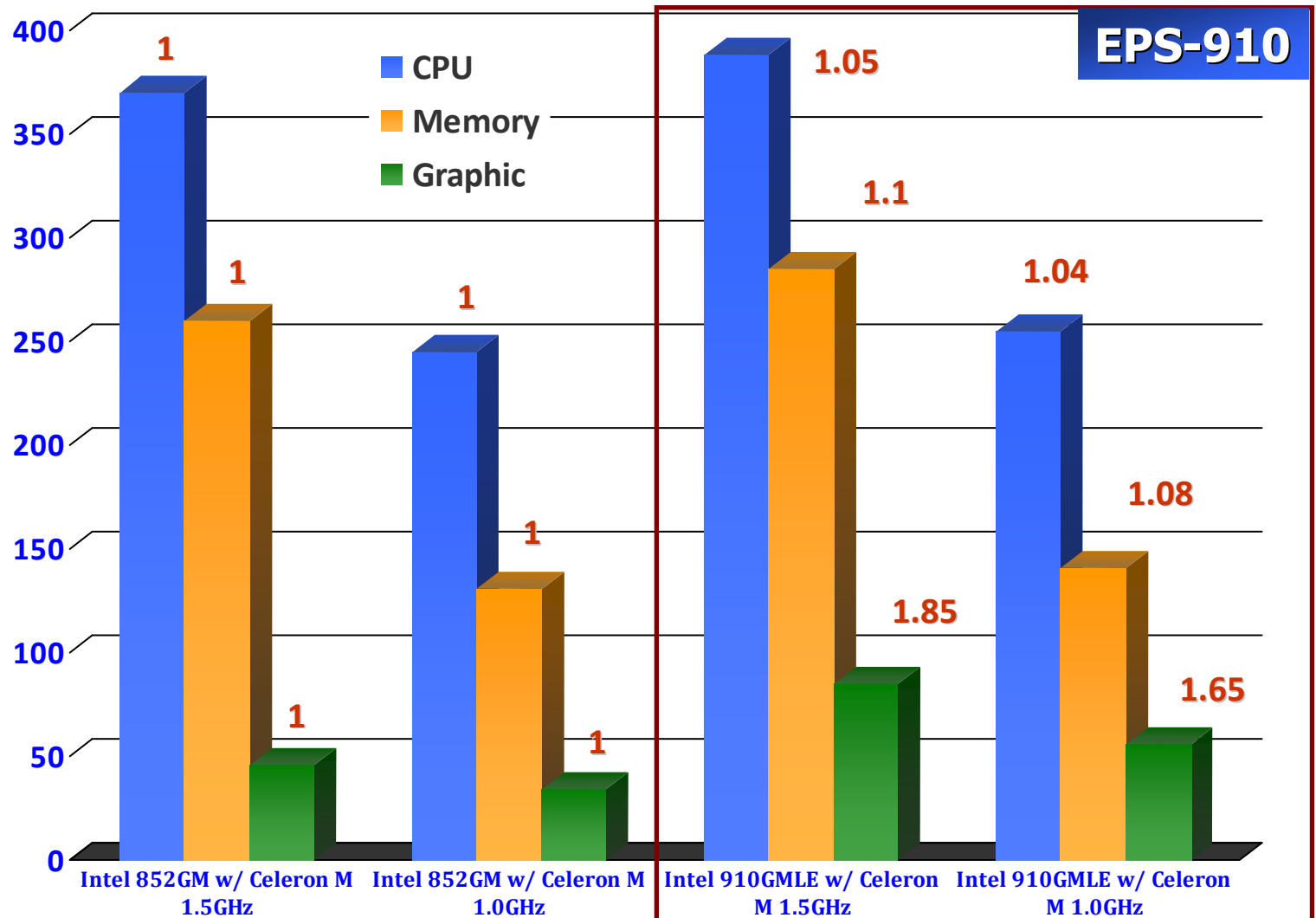*Peak - Half-Sine Wave*
Pulse Duration - 11 ms

Why Avalue EPS-910?

Item	EPS-910	General Embedded system
Mechanical **WIN**	Robust Mechanical Design	Normal Metal Box Design
Thermal Conduction **WIN**	Ultra-Fanless Design Operating -15 to 55 deg.C	Normal Fanless Industrial Std. Operating 0 to 45 deg.C
Shock **WIN**	IEC60068-2-27, Compact Flash: 50G, half sine, 11 ms	None
Vibration **WIN**	IEC 60068-2-64, Compact Flash: 5G, random, 5 ~ 500 Hz, 1 hr/axis	None
Power Input **WIN**	9 to 32V Wide Range Acceptable Screw DC Jack (*Opt. Terminal Block*)	Only 12V or 19V input DC Jack
USB **WIN**	Six USB ports	Two to Four USB ports
COM **WIN**	Four COM ports	One or two COM ports
Expansion **WIN**	Express Card/34mm Slot & PCI-E x1 to PCI (Optional)	Mini-PCI Slot or PCI Slot
Service Windows **WIN**	Service Windows for installing Memory and HDD	None

Opt. : Optional

Performance Comparison - PassMark

EPS-910

Chart legend:
- CPU (blue)
- Memory (orange)
- Graphic (green)

Values by group:

Intel 852GM w/ Celeron M 1.5GHz: CPU 1, Memory 1, Graphic 1
Intel 852GM w/ Celeron M 1.0GHz: CPU 1, Memory 1, Graphic 1
Intel 910GMLE w/ Celeron M 1.5GHz: CPU 1.05, Memory 1.1, Graphic 1.85
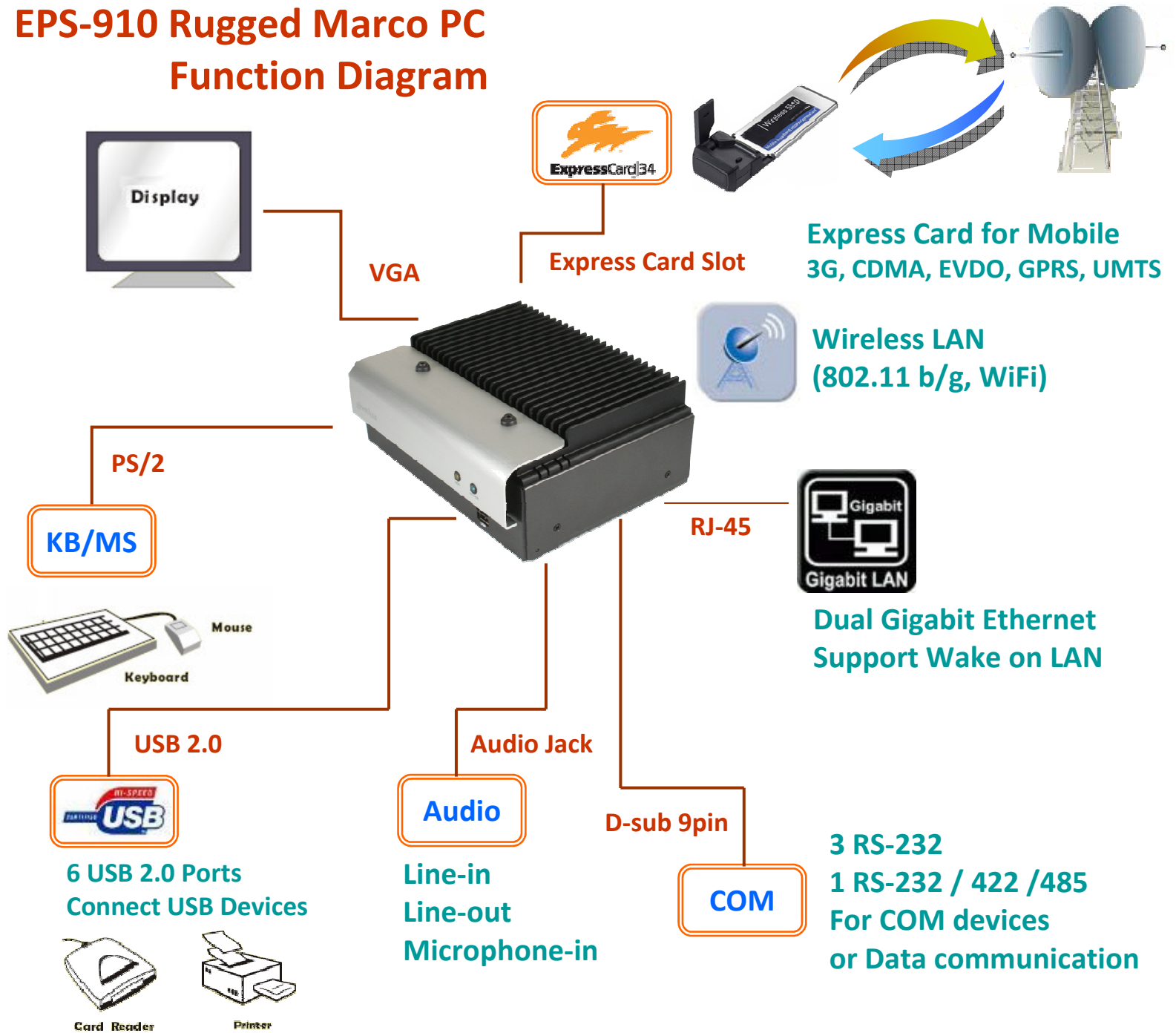Intel 910GMLE w/ Celeron M 1.0GHz: CPU 1.04, Memory 1.08, Graphic 1.65

Intel 910GMLE CPU Performance is **4~5%** better than Intel 852GM

Intel 910GMLE Memory Performance is **8~10%** better than Intel 852GM

Intel 910GMLE Graphic Performance is **65~85%** better than Intel 852GM

EPS-910 Rugged Marco PC Function Diagram

Display — VGA

Express Card Slot

Express Card for Mobile
3G, CDMA, EVDO, GPRS, UMTS

Wireless LAN
(802.11 b/g, WiFi)

PS/2 — **KB/MS**

Mouse
Keyboard

RJ-45

Dual Gigabit Ethernet
Support Wake on LAN

USB 2.0

Audio Jack — **Audio**

D-sub 9pin — **COM**

6 USB 2.0 Ports
Connect USB Devices

Card Reader   Printer

Line-in
Line-out
Microphone-in

3 RS-232
1 RS-232 / 422 /485
For COM devices
or Data communication

Ordering Information

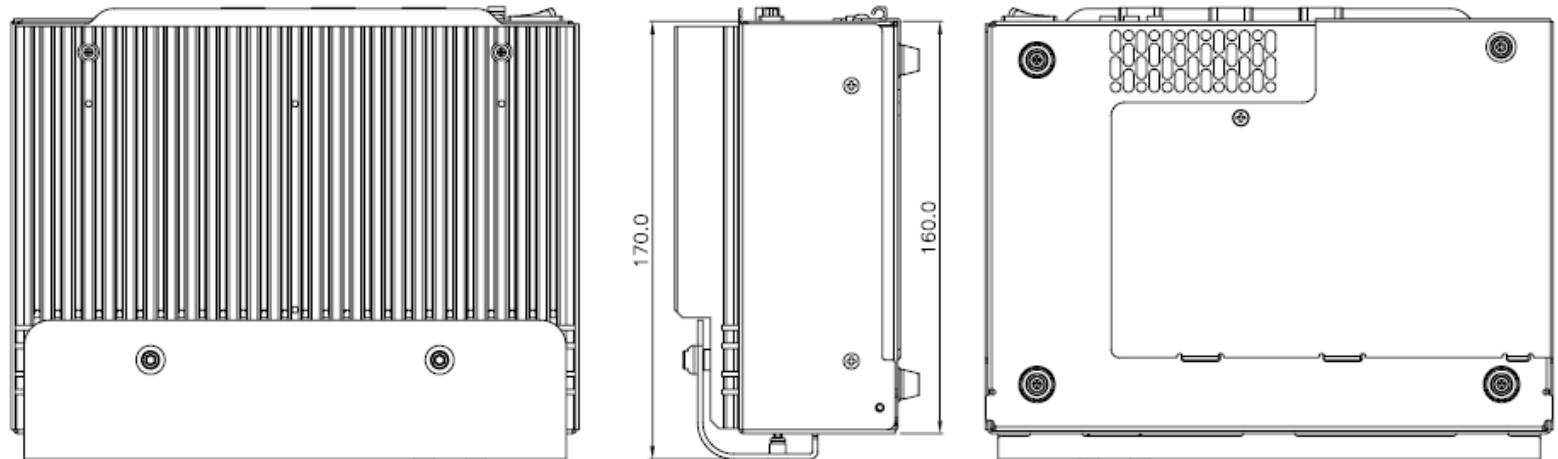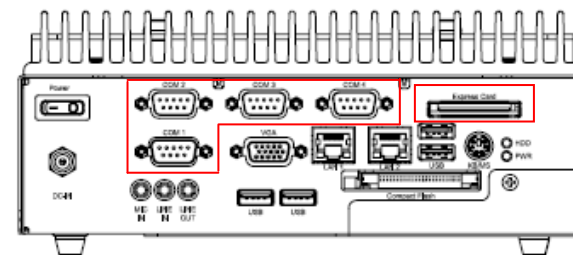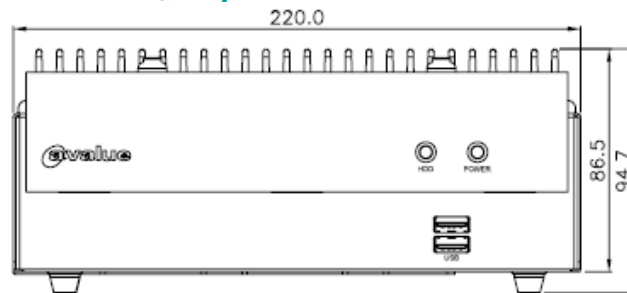| Order Information	Part Number	Description
EPS-910	EPS-910-A1-1R	CPU: Intel Celeron M 600MHz with 512K L2 Cache Chipset: 910GMLE + ICH6M Memory: 1GB DDR2 Dimension: 220 x 180 x 80mm Front I/O: 2 USB Rear I/O: CF, VGA, 2 LAN, 4 COM, 4 USB, L/O, L/I, Mic-in, DC Jack, PS/2, Express Card 34mm, Power Switch Power Input: 9~32V Vibration: 5G (CF), 1G (Automobile HDD) Shock: 50G (CF), 5G (Automobile HDD) Power Adapter: 12V/5A 60W Screw Type
EPS-910-WallMount	EPS-910-Wall-1R	EPS-910 Wall Mount Kit

EPS-910 Wall Mount

Marketing Materials

- **Website:**
  - http://www.avalue.com.tw/products/EPS-910.cfm
- **DM:**
  - http://www.avalue.com.tw/support/downloadResults.cfm?model_num=EPS-910&category1=Datasheet
- **Newsletter**
  - http://www.avalue.com.tw/news/N080447.cfm
- **QIG**
  - EPS-910 1st Quick Reference Guide.pdf
- **Test Report**
  - Shock Test Report
    - EPS-910-CF-Shock-50G
    - EPS-910-HDD-Shock-20G
  - Vibration Test Report
    - EPS-910-CF-Vibration-5.0Grms
    - EPS-910-HDD-Vibration-1.0Grms
  - Thermal Test Report – Operating & Storage
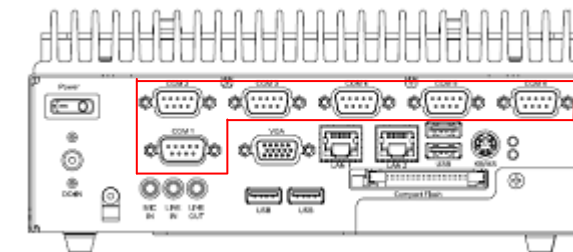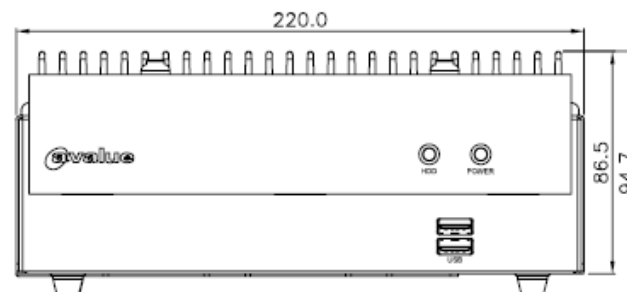 - Wide Voltage Power 9~32V Power Input Test Report

Mechanical Drawing

170.0

160.0

4 COM w/ Express Card Slot

220.0

86.5
94.7

4 COM +
Express Card

6 COM w/o Express Card Slot

220.0

86.5
94.7

6 COM

EPS Product Line

	Model	MOQ	Engineer Sample	Pilot Run	MP
EPS-910	Celeron M 600MHz	Standard Non-MOQ	-	15pcs End-Aug.	Mid-Sep.
	Celeron M 1GHz	50 pcs	-	-	By request
	Celeron M 600MHz w/ 2 PCI	50 pcs	-	-	By request
	Celeron M 1GHz w/ 2 PCI	50 pcs	-	-	By request
EPS-AT270	Atom N270 1.6GHz	Standard Non-MOQ	1pcs End-Aug.	15 pcs Mid-Oct.	Beg-Nov
	Atom N270 1.6GHz w/ 2 PCI	Standard Non-MOQ	1pcs. Mid-Sep	10pcs End-Nov	Mid-Dec

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