

# **BMX-T521-BSW**

**Fanless Intel® Celeron® Processor N3160 Mini ITX Box PC**

## **Quick Reference Guide**

**1<sup>st</sup> Ed –16 June 2016**

### **Copyright Notice**

Copyright © 2016 Avalue Technology Inc., ALL RIGHTS RESERVED.

## **FCC Statement**



THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

- (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

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.

## **Copyright Notice**

Copyright © 2016 Avalue Technology Inc., ALL RIGHTS RESERVED.

No part of this document may be reproduced, copied, translated, or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the prior written permission of the original manufacturer.

## **Disclaimer**

Avalue Technology Inc. reserves the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. Avalue Technology assumes no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. Avalue Technology Inc. makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

# CONTENT

<b>1. Getting Started .....</b>	<b>4</b>
1.1 Safety Precautions .....	4
1.2 Packing List .....	4
1.3 System Specifications .....	5
1.4 System Overview.....	8
1.4.1 Front/Rear/Side View.....	8
1.5 System Dimensions.....	10
<b>2. Hardware Configuration.....</b>	<b>11</b>
2.1 BMX-T521-BSW connector mapping.....	12
2.1.1 Serial port 1~6 connector (COM1~6).....	12
2.1.2 VGA connector (VGA).....	12
2.2 Installing SD card (BMX-T521-BSW).....	13
2.3 Installing Hard Disk (BMX-T521-BSW).....	14

# 1. Getting Started

## 1.1 Safety Precautions

### Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

### Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

## 1.2 Packing List

- 1 x BMX-T521-BSW Fanless Intel® Celeron® Processor N3160 Mini ITX Box PC
- Other major components include the followings:
  - Adapter
  - Power Cord



---

If any of the above items is damaged or missing, contact your retailer.

---

## 1.3 System Specifications

System	
Mother Board	<ul style="list-style-type: none"> <li>• EMX-BSWP</li> </ul>
CPU	<ul style="list-style-type: none"> <li>• Onboard Intel® Celeron® Processor N3160 (2M Cache, up to 2.24 GHz)</li> </ul>
CPU Cooler (Type)	<ul style="list-style-type: none"> <li>• Fanless</li> </ul>
Memory	<ul style="list-style-type: none"> <li>• 2 x 204-pin DDR3L 1600 MHz SO-DIMM socket, supports up to 8GB Max (Default: 1 x 2GB DDR3L)</li> </ul>
Adapter	<ul style="list-style-type: none"> <li>• 60W Adapter (DC in 12V@5A)</li> </ul>
Microphone	<ul style="list-style-type: none"> <li>• 1 x Mic-in</li> </ul>
Bluetooth	<ul style="list-style-type: none"> <li>• By Mini PCI-e module (optional)</li> </ul>
Operating System	<ul style="list-style-type: none"> <li>• Windows/ Linux</li> </ul>
SIM card slot	<ul style="list-style-type: none"> <li>• 1 x SIM card slot</li> </ul>
Storage	
Hard Disk Drive	<ul style="list-style-type: none"> <li>• 2 x 2.5" HDD/SSD Bays</li> </ul>
External I/O	
Serial Port	<ul style="list-style-type: none"> <li>• 6 x RS-232</li> </ul>
USB Port	<ul style="list-style-type: none"> <li>• 4 x USB3.0, 4 x USB2.0</li> </ul>
DIO Port	<ul style="list-style-type: none"> <li>• 8-bit GPIO (by external cable optional)</li> </ul>
Video Port	<ul style="list-style-type: none"> <li>• 1 x HDMI, 1 x VGA</li> </ul>
Audio Port	<ul style="list-style-type: none"> <li>• 1 x Line-out, 1 x Mic-in</li> </ul>
LAN Port	<ul style="list-style-type: none"> <li>• 2 x Intel I211AT Gigabit Ethernet</li> </ul>
Wireless LAN Antenna	<ul style="list-style-type: none"> <li>• 2 x SMA Connector (Optional)</li> </ul>
Switch	<ul style="list-style-type: none"> <li>• 1 x Power on/off membrane with Power LED</li> </ul>
Indicator Light	<ul style="list-style-type: none"> <li>• 1 x HDD/SSD LED,</li> <li>• 2 x LAN Activity Indicator LED</li> </ul>
Expansion Slots	<ul style="list-style-type: none"> <li>• 1 x full size Mini PCI-e socket supports mSATA only (SATA II and mSATA Switchable Through jumper)</li> <li>• 1 x full size Mini PCI-e supports WiFi &amp; 3G/4G module</li> <li>• 1 x SD card slot supports SD/ SDHC Card</li> </ul>
Mechanical	
Power Type	<ul style="list-style-type: none"> <li>• AT / ATX mode Switchable Through Jumper (Default: ATX mode)</li> </ul>
Power Connector Type	<ul style="list-style-type: none"> <li>• Lockable DC Jack</li> </ul>
Dimension	<ul style="list-style-type: none"> <li>• 180 x 182 x 76 (L x W x H)</li> </ul>
Weight	<ul style="list-style-type: none"> <li>• 2.3 kg</li> </ul>
Color	<ul style="list-style-type: none"> <li>• Black</li> </ul>
Fanless	<ul style="list-style-type: none"> <li>• Yes</li> </ul>

Reliability	
EMI Test	<ul style="list-style-type: none"> <li>CE/FCC Class B design compatible</li> </ul>
Safety	<ul style="list-style-type: none"> <li>UL/CB design compatible</li> </ul>
Vibration Test	<ul style="list-style-type: none"> <li><u>Sine Vibration test (Non-operation)</u></li> <li>Reference IEC60068-2-6 Testing procedures</li> <li>Test Fc : Vibration sinusoidal               <ol style="list-style-type: none"> <li>1 Test Acceleration : 2G</li> <li>2 Test frequency : 5 ~ 500 Hz</li> <li>3 Sweep : 1 Oct/ per one minute. (logarithmic)</li> <li>4 Test Axis : X,Y and Z axis</li> <li>5 Test time :30 min. each axis</li> <li>6 System condition : Non-Operating mode</li> </ol> </li> <li><u>Package Vibration Test</u></li> <li>Reference IEC60068-2-64 Testing procedures</li> <li>Test Fh : Vibration boardband random Test               <ol style="list-style-type: none"> <li>1. PSD: 0.026G<sup>2</sup>/Hz , 2.16 Grms</li> <li>2. Non-operation mode</li> <li>3. Test Frequency : 5-500Hz</li> <li>4. Test Axis : X,Y and Z axis</li> <li>5. 30 min. per each axis</li> </ol> </li> <li><u>Random Vibration Operation</u></li> <li>Reference IEC60068-2-64 Testing procedures</li> <li>Test Fh : Vibration boardband random Test               <ol style="list-style-type: none"> <li>1. PSD: 0.00454G<sup>2</sup>/Hz, 1.5 Grms</li> <li>2. Operation mode</li> <li>3. Test Frequency : 5-500Hz</li> <li>4. Test Axis : X,Y and Z axis</li> <li>5. 30 minutes per each axis</li> <li>6. IEC 60068-2-64 Test: Fh</li> <li>7. Storage : SSD or mSATA</li> </ol> </li> </ul>
Mechanical Shock Test	<ul style="list-style-type: none"> <li><u>Bump Test</u></li> <li>Reference IEC 60068-2-29 Testing procedures</li> <li>Test Eb : Bump Test               <ol style="list-style-type: none"> <li>1. Wave form : Half Sine wave</li> <li>2. Acceleration Rate : 10g for operation mode</li> <li>3. Duration Time : 11ms</li> <li>4. No. of Shock : Z axis 300 times</li> <li>5. Test Axis: Z axis</li> </ol> </li> </ul>

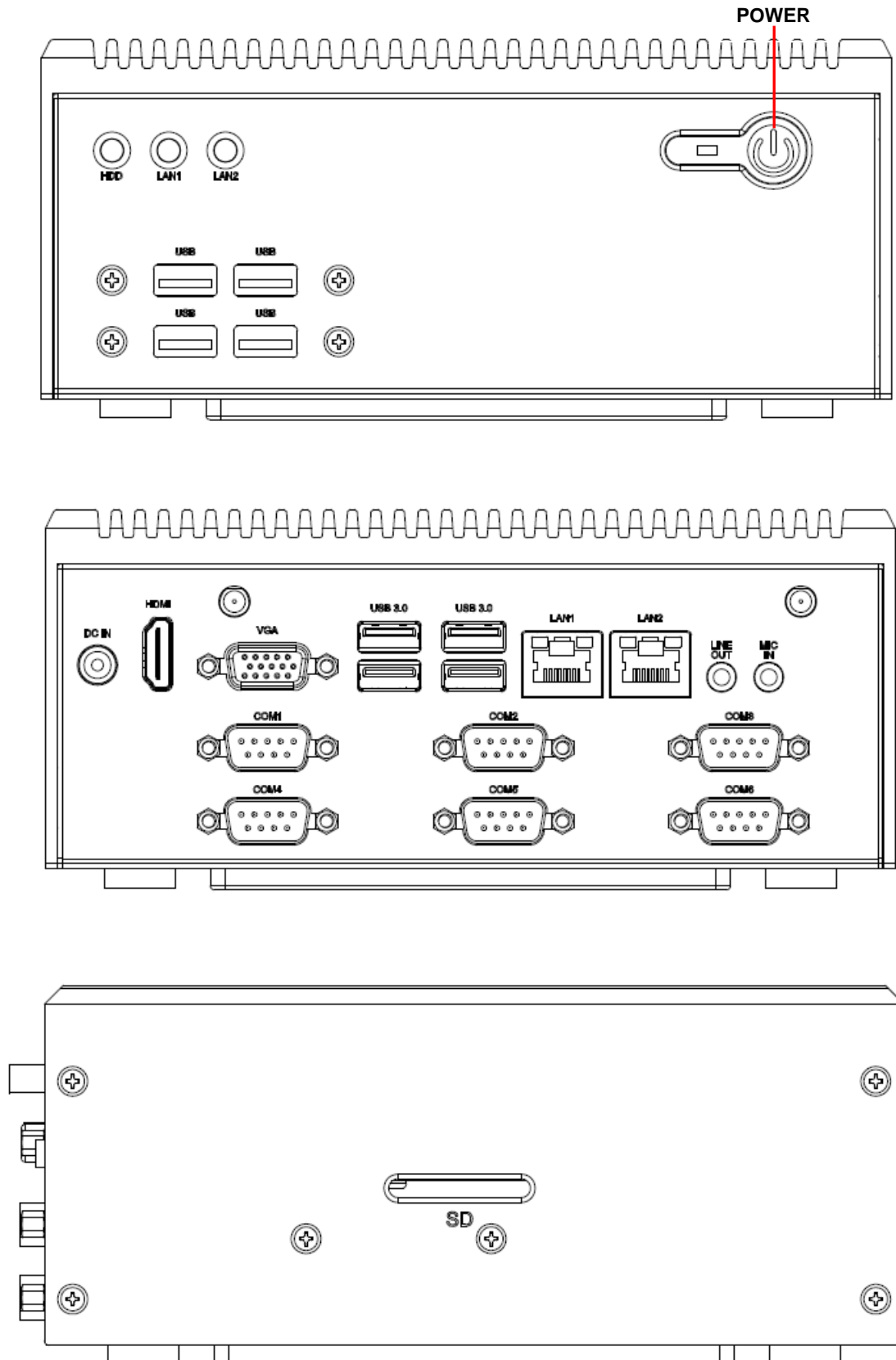
	6. Operation mode
<b>Drop Test</b>	<ul style="list-style-type: none"> <li>• <u>Packing Drop</u></li> <li>• Reference ISTA 2A, Method : IEC-60068-2-32 Test:Ed Test Ea : Drop Test               <ol style="list-style-type: none"> <li>1. One corner , three edges, six faces</li> <li>2. ISTA 2A, IEC-60068-2-32 Test:Ed</li> </ol> </li> </ul>
<b>Operating Temperature</b>	<ul style="list-style-type: none"> <li>• 0°C ~ 35°C (32°F ~ 95°F) (w/HDD), ambient w/ air flow.</li> <li>• 0°C ~ 40°C (32°F ~ 104°F) (w/HDD), ambient w/ air flow for single HDD only.</li> <li>• 0°C ~ 45°C (32°F ~ 113°F) (w/SSD, mSATA), ambient w/ air flow</li> </ul>
<b>Operating Humidity</b>	<ul style="list-style-type: none"> <li>• 0% ~ 90% Relative Humidity, Non-condensing</li> </ul>
<b>Storage Temperature</b>	<ul style="list-style-type: none"> <li>• -20°C ~ 75°C (-4°F ~ 167°F)</li> </ul>

**Note:**

1. If user want to install Win 8.1 Pro OS on eMMC of EMX-BSWP motherboard, User must do:
  - A. BIOS setup menu must select eMMC mode with "PCI mode"(because selection with "ACPI mode" during OS install, OS cannot find eMMC to install).
  - B. Windows OS must use Microsoft Win 8.1 Pro with update version of OS image to install.
2. Brightness control method choose "OS driver", due to Win7 VGA Driver will cause brightness at 100%, Backlight adjustment only support to maximum voltage to **2.5V**. Therefore, should change item value string as Image 1, when choose Brightness control method "OS driver", please use OS Win8/10.
3. Win7 does not support SD card.
4. When OS is Win7/DOS(default), please choose "Legacy System/Win7" at BIOS setup item. When OS is Win8/10, please choose "Win8/Win10" at BIOS setup item (Please refer page.65 BOM Config settings.)
5. Specifications are subject to change without notice.

## 1.4 System Overview

### 1.4.1 Front/Rear/Side View

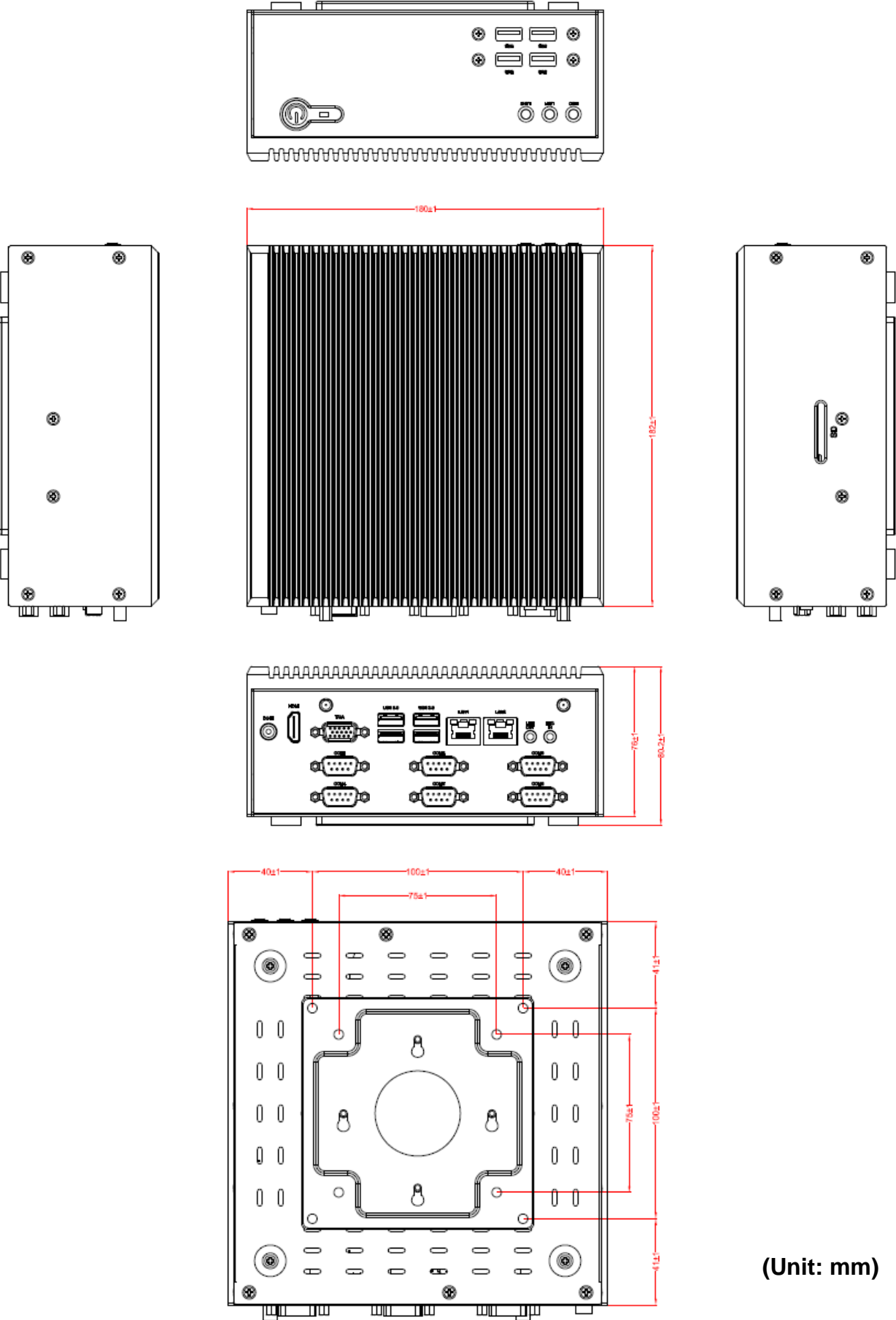




**Connectors**

<b>Label</b>	<b>Function</b>	<b>Note</b>
<b>POWER</b>	Power on button	
<b>HDD</b>	HDD Indicator	
<b>LAN1/2</b>	RJ-45 Ethernet 1/2	
<b>USB</b>	4 x USB2.0 connector 4 x USB3.0 connector	
<b>COM1~6</b>	Serial port 1~6 connector	
<b>DC IN</b>	DC power-in connector	
<b>HDMI</b>	HDMI connector	
<b>LINE OUT</b>	Line-out audio jack	
<b>MIC IN</b>	Mic-in audio jack	
<b>VGA</b>	VGA connector	
<b>SD</b>	SD card slot	

1.5 System Dimensions



(Unit: mm)

## 2. Hardware Configuration

---

For advanced information, please refer to:

1- EMX-BSWP User's Manual

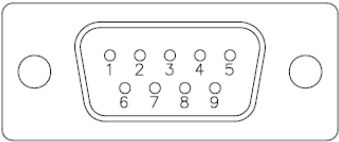
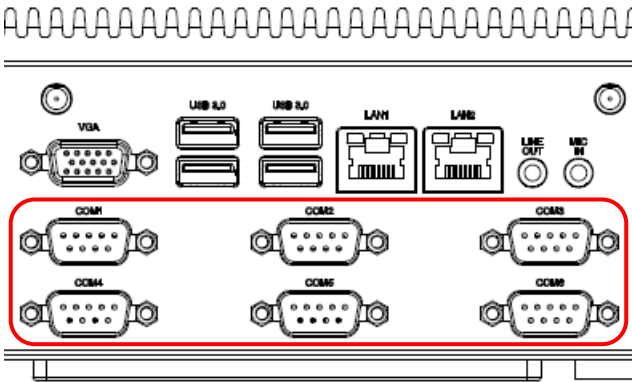


**Note:** If you need more information, please visit our website:

<http://www.avalue.com.tw>

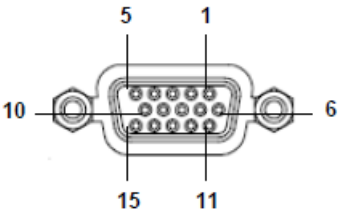
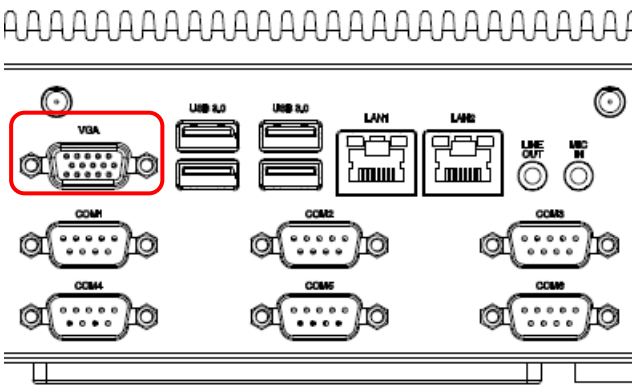
2.1 BMX-T521-BSW connector mapping

2.1.1 Serial port 1~6 connector (COM1~6)



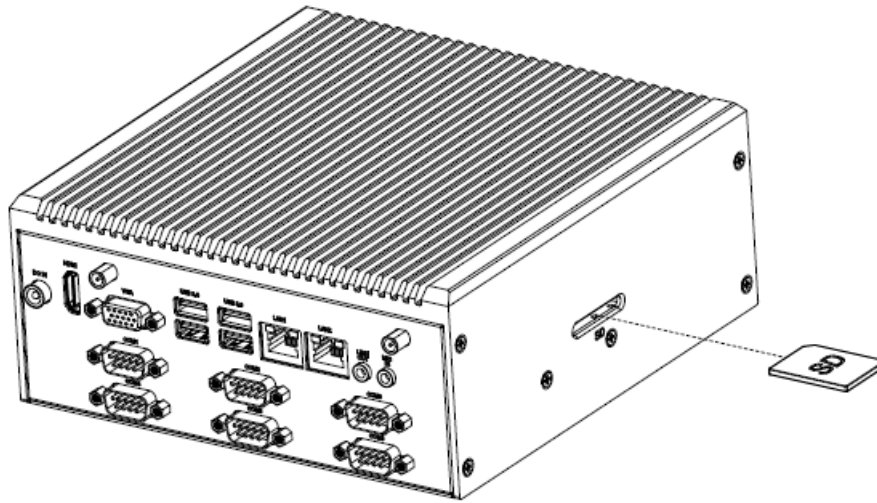
Signal	PIN	PIN	Signal
DCD	1	6	DSR
RXD	2	7	RTS
TXD	3	8	CTS
DTR	4	9	RI
GND	5		

2.1.2 VGA connector (VGA)



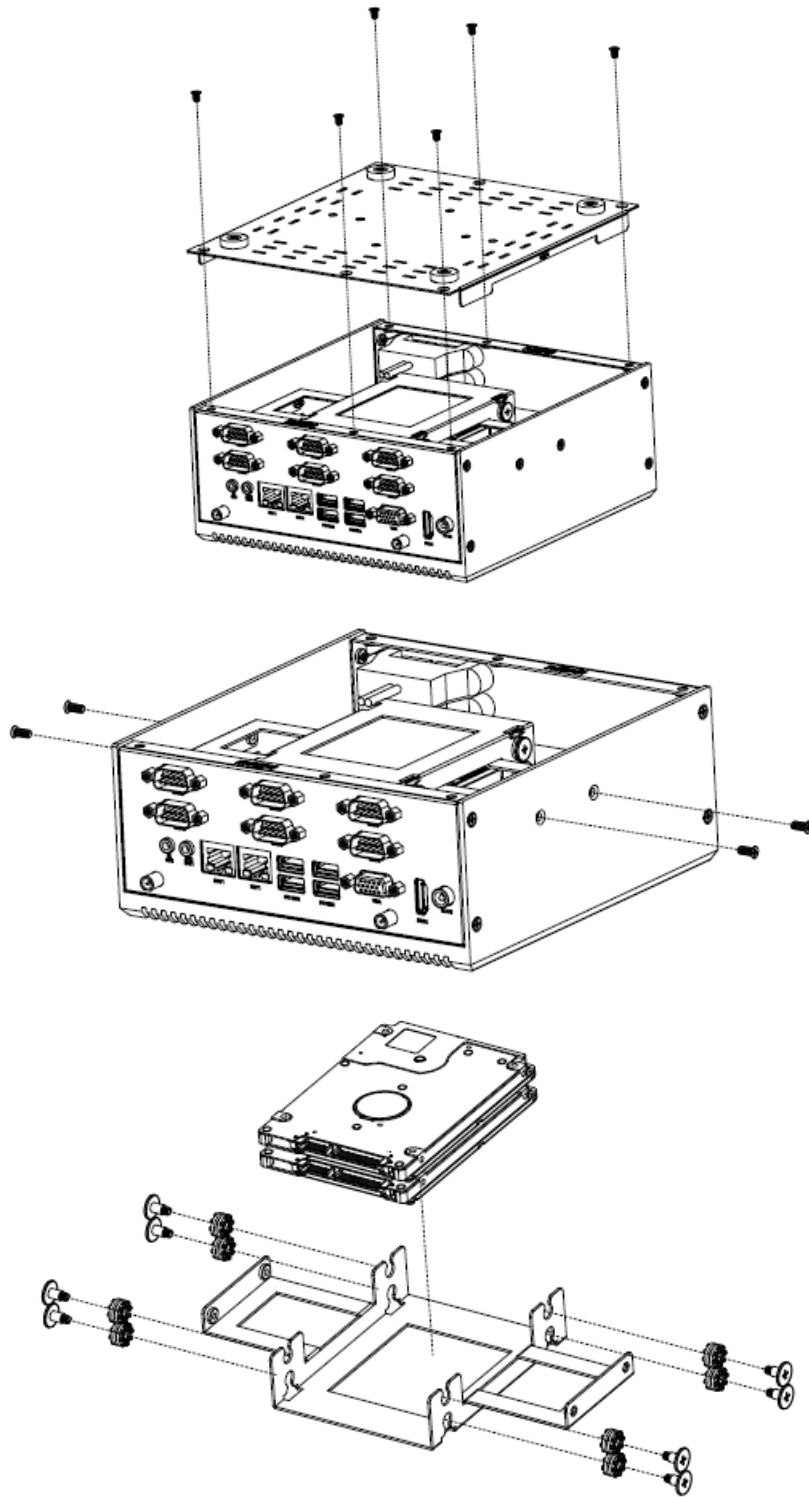
PIN	Signal	PIN	Signal	PIN	Signal
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	DDCDAT
3	BLUE	8	GND	13	HSYNC
4	NC	9	+5V	14	VSYSNS
5	GND	10	GND	15	DDCCLK

## 2.2 Installing SD card (BMX-T521-BSW)



**Step 1.** Insert SD card into SD slot.

## 2.3 Installing Hard Disk (BMX-T521-BSW)



**Step1.** Remove 10 screws from rear and each side before removing back cover.

**Step2.** Secure HDD by means of 8 screws.

**Step3.** Re-assemble your system back through previous steps to complete the installation.

