

**ATX motherboard supports 14nm Intel® Xeon® D1500 family, DDR4,  
VGA, dual Intel® GbE/dual Intel® 10GbE, four USB 3.0,  
six SATA 6Gb/s, RoHS**

# **IMBA-BDE**

## **Quick Installation Guide**

**Version 1.0**

Apr 28, 2017

### **Package List**

IMBA-BDE package includes the following items:

- 1 x IMBA-BDE single board computer
- 1 x I/O shielding
- 2 x SATA cable
- 1 x Utility CD
- 1 x QIG
- 1 x One Key Recovery CD



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## Specifications

- CPU:  
Intel® Xeon processor D-1500 product family
- BIOS: AMI BIOS
- Memory:  
Four 288-pin 2133 MHz dual-channel DDR4 SDRAM unbuffered DIMMs support up to 128 GB
- Display Output:  
1 x VGA (up to 1920x1200@60 Hz)
- Ethernet:  
LAN1: Intel® I210-AT PCIe controller  
LAN2: Intel® I210-AT PCIe controller  
LAN3&4: Inphi CS4227 PHY (optional)
- External I/O Interfaces:  
1 x KB/MS  
1 x RS-232  
2 x USB 2.0  
4 x USB 3.0
- Internal I/O Interfaces:  
1 x KB/MS (1x6 pin)  
1 x USB 2.0 (180° Type-A)  
4 x USB 2.0 (2x4 pin, P=2.54)  
1 x RS-232/RS-422/485 (2x5 pin, P=2.54)  
4 x RS-232 (2x5 pin, P=2.54)  
6 x SATA 6Gb/s (RAID 0/1/5/10 supported)
- Front Panel:  
1 x Front panel (2x7 pin, power LED, HDD LED, speaker, power button, reset button)
- LAN LED: 2 x LAN LED (1x2 pin)
- TPM: 1 x TPM (2x10 pin)
- SMBus: 1 x SMBus (1x4 pin)

- I<sup>2</sup>C: 1 x I<sup>2</sup>C (1x4 pin)
- Digital I/O: 8-bit digital I/O (2x5 pin)
- Expansion :
  - 1 x 10GbE LAN card slot (white PCIe x 8 slot)
  - 1 x M.2 connector (M key, 2242~2280, SATA & PCIe x2 signal)
  - 1 x PCIe x4 Gen 2 (PCIE2x4\_1)
  - 5 x PCIe x4 Gen 3
- Watchdog Timer:
  - Software programmable supports 1~255 sec. system reset
- Fan Connector:
  - 1 x CPU smart fan (1x4 pin)
  - 1 x System smart fan (1x4 pin)
- Power supply:
  - ATX power supply, ATX/AT mode support
- Power Consumption: 3.3V@0.11A, 5V@2.83A, 12V@3.97A  
(Intel® Xeon D-1548 2.0GHz CPU with 32GB (four 4 GB) 2133MHz DDR4 memory)
- Operating Temperature: 0°C ~ 60°C
- Storage Temperature: -10°C ~ 70°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 244mm x 305mm
- Weight: GW: 1200g / NW: 700g

## Ordering Information

- **IMBA-BDE-1548-R10:**  
ATX motherboard supports 14nm Intel® Xeon® D-1548, DDR4, VGA, dual Intel® GbE/dual 10GbE, four USB 3.0, six SATA 6Gb/s, RoHS
- **IMBA-BDE-1518-R10:**  
ATX motherboard supports 14nm Intel® Xeon® D-1518, DDR4, VGA, dual Intel® GbE/dual 10GbE, four USB 3.0, six SATA 6Gb/s, RoHS
- **LAN-10G2F-PHY-CS4227:**  
10 GbE LAN card, dual port support, RoHS
- **19800-000049-RS:** LPT flat cable, 240mm, P=2.54
- **19800-000075-RS:** PS/2 KB/MS cable with bracket, 220mm, P=2.0
- **19800-003100-100-RS:**  
Dual port USB cable with bracket, 300mm, P=2.54
- **19800-020100-100-RS:**  
RS-232 cable with bracket, Dual 10-pin to dual DB-9, 230mm, P=2.54
- **32102-000100-200-RS:**  
SATA power cable, MOLEX 5264-4P to SATA15P
- **32205-003800-300-RS:** RS-422/485 cable, 200mm, P=2.0
- **TPM-IN01-R20:**  
20-pin Infineon TPM module, software management tool, firmware v3.17

## Jumpers setting and connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX Mode Select Switch
JP2, JP3	Clear CMOS Button
CN4	CPU Fan Connector
12V_ATX1	+12V Power Connector
ATX1	ATX Power Connector
JDIMM1, JDIMM2, JDIMM3, JDIMM4	DDR4 DIMM slots
DIO1	Digital Input / Output Connector
CN7	EC Debug Port Connector
JSPI1	SPI Programming Connector For System BIOS
JSPI2	SPI Programming Connector For EC
JSPI3	SPI Programming Connector For BMC
F_PANEL1	External Switches and Indicators Panel
COM3-6	Internal RS-232 Serial Port Connectors
COM2	Internal RS-422/485 Serial Port Connector
SATA0, SATA1, SATA2 SATA3, SATA4, SATA5	Serial ATA 3.0 Connectors
CN13	SMBUS Connector
J2	EC SMBUS Debug Connector
CN5	System Fan Connector
TPM1	For BIOS Bebug Only
USB1, USB2	Internal USB 2.0 Connectors
USB3	90 Degree USB 2.0 Connector
J1	8 Pin CPLD Flash Connector
COM1	External RS-232 Serial Port Connector
LAN1_USB1	RJ45 LAN and USB 3.0 Connectors
LAN2_USB2	RJ45 LAN and USB 2.0 Connectors
LAN3_USB3	USB 2.0 Connector
KBMS1	PS/2 Keyboard and Mouse Connector
VGA1	VGA Connectors

<b>J_ATX_AT1: AT/ATX Power Mode Setting</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short A-B	ATX Power Mode (default)
Short B-C	AT Power Mode

<b>JP2, JP3: Clear CMOS Setup</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
Short 1-2 (default)	Keep CMOS Setup (Normal Operation)
Short 2-3	Clear CMOS Setup

<b>LAN1_USB1: Ethernet and USB 3.0 connectors</b>			
<b>LAN1: RJ45 LAN connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	MD0+	2	MD0-
3	MD1+	4	MD1-
5	MD2+	6	MD2-
7	MD3+	8	MD3-
9	VCC	10	GND
11	LINK_ACT+	12	LINK_ACT-
13	100-	14	1000-
15	GND		
<b>USB1: External USB 3.0 connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VBUS	2	D1-
3	D1+	4	GND1
5	STDA_SSRX1_N	6	STDA_SSRX1_P
7	GND_DRAIN	8	STDA_STX1_N
9	STDA_STX1_P		

<b>LAN2_USB2: RJ45 LAN and USB 2.0 Connector</b>			
<b>LAN2: RJ45 LAN connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	MD0+	2	MD0-
3	MD1+	4	MD1-
5	MD2+	6	MD2-
7	MD3+	8	MD3-
9	VCC	10	GND
11	LINK_ACT+	12	LINK_ACT-
13	100-	14	1000-
15	GND		
<b>USB2: External USB 2.0 connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VBUS	2	D1-
3	D1+	4	GND1

<b>LAN3_USB3: USB 2.0 Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VBUS	2	D1-
3	D1+	4	GND1

<b>KBMS1: PS/2 Keyboard and mouse connector</b>			
<b>KBMS1 (Purple): 6-pin Mini-DIN keyboard connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	Keyboard Data	2	NC
3	GND	4	VCC
5	Keyboard Clock	6	NC
<b>KBMS1 (Green): 6-pin Mini-DIN Mouse Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	Mouse Data	2	NC
3	GND	4	VCC
5	Mouse Clock	6	NC

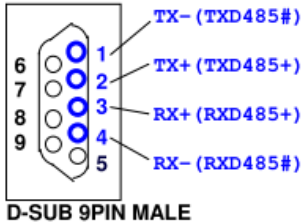
<b>COM1: External RS-232 serial port connector</b>	
<b>PIN NO.</b>	<b>DESCRIPTION</b>
D1	DATA CARRIER DETECT (DCD1)
D2	RECEIVE DATA (RXD1)
D3	TRANSMIT DATA (TXD1)
D4	DATA TERMINAL READY (DTR1)
D5	GND (GND1)
D6	DATA SET READY (DSR1)
D7	REQUEST TO SEND (RTS1)
D8	CLEAR TO SEND (CTS1)
D9	RING INDICATOR (RI1)

<b>VGA1: VGA connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	CRT_PLUG#
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC
15	DDCCLK		

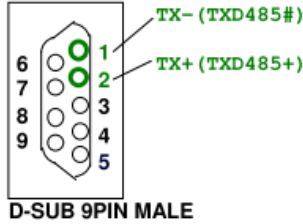


COM2: Internal RS422/485 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RXD485#	2	RXD485+
3	TXD485+	4	TXD485#

#### RS422 Pin define



#### RS485 Pin define



COM3-6: Internal RS-232 serial port connectors				
Function	PIN	DESCRIPTION	PIN	DESCRIPTION
COM3	1	DCD	2	DSR
	3	RXD	4	RST
	5	TXD	6	CTS
	7	DTR	8	RI
	9	GND	10	GND
COM4	11	DCD	12	DSR
	13	RXD	14	RST
	15	TXD	16	CTS
	17	DTR	18	RI
	19	GND	20	GND
COM5	21	DCD	22	DSR
	23	RXD	24	RST
	25	TXD	26	CTS
	27	DTR	28	RI
	29	GND	30	GND
COM6	31	DCD	32	DSR
	33	RXD	34	RST
	35	TXD	36	CTS
	37	DTR	38	RI
	39	GND	40	GND

<b>SATA0~5: Serial ATA 3.0 connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	5	RX-
2	TX+	6	RX+
3	TX-	7	GND
4	GND	8	N/C

<b>JSPI1: SPI Programming Connector For System BIOS</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+V3.3M_SPI_CON	2	SPI_CS
3	SPI_SO_SW	4	SPI_CLK_SW
5	SPI_SI_SW	6	GND

<b>JSPI2: SPI Programming Connector For EC</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+V3.3M_SPI_CON	2	SPI_CS
3	SPI_SO_SW	4	SPI_CLK_SW
5	SPI_SI_SW	6	GND

<b>JSPI3: SPI Programming Connector For BMC</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+V3.3M_SPI_CON	2	SPI_CS
3	SPI_SO_SW	4	SPI_CLK_SW
5	SPI_SI_SW	6	GND

<b>CN4&amp;5:CPU &amp; System Fan Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	+V12S
3	Rotation Signal	4	PWM Control Signal

<b>DIO1: Digital Input / Output Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	+V5S
3	DOUT4	4	DOUT3
5	DOUT2	6	DOUT1
7	DIN4	8	DIN3
9	DIN2	10	DIN1

<b>F_PANEL1: External Switches and Indicators Panel</b>					
	<b>PIN</b>	<b>DESCRIPTION</b>	<b>PIN</b>	<b>DESCRIPTION</b>	
PWR LED	1	LED_PWR	2	BEEP_PWR	SPKR
	3	NC	4	NC	
	5	GND	6	NC	
PWR BTN	7	PWR_BTN	8	PC_BEEP#	RESET
	9	GND	10	NC	
HDD LED	11	SATA_LED+	12	RESET	
	13	SATA_LED-	14	GND	

<b>ATX1: ATX Power Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

<b>12V_ATX1: +12V Power Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	GND
3	+12V	4	+12V

<b>CN7: EC Debug Port Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	EC_EPP_STB#	2	EC_EPP_AFD#
3	EC_EPP_PD0	4	NC
5	EC_EPP_PD1	6	EC_EPP_INIT#
7	EC_EPP_PD2	8	EC_EPP_SLIN#
9	EC_EPP_PD3	10	GND
11	EC_EPP_PD4	12	NC
13	EC_EPP_PD5	14	EC_EPP_BUSY
15	EC_EPP_PD6	16	EC_EPP_KSI5
17	EC_EPP_PD7	18	EC_EPP_KSI4

<b>TPM1: For BIOS Bebug Only</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	LCLK	2	GND
3	LFRAME#	4	KEY
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

<b>CN13: SMBus Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	GND	2	SMB_DATA
3	SMB_CLK	4	+5V

<b>J2: EC SMBUS Debug Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	3.3V	2	EC_SMB_CLK
3	EC_SMB_DAT	4	GND

<b>USB1, USB2: Internal USB 2.0 connectors</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC	2	GND
3	USB_DATA-	4	USB_DATA+
5	USB_DATA+	6	USB_DATA-
7	GND	8	VCC

<b>USB3: 90 Degree USB 2.0 Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	VCC	2	USB_DATA-
3	USB_DATA+	4	GND

<b>J1: 8 Pin CPLD Flash Connector</b>			
<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	3.3V	2	CPLD_TDO
3	CPLD_TDI	4	NC
5	NC	6	CPLD_TMS
7	GND	8	CPLD_TCK

