

Quick Reference Manual

VDX3-ETX

Version 2.0



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Revision History

Revision	Date	Remark
1.0	Mar 1, 2015	First release
2.0	July 20, 2015	For new hardware version, add Giga LAN 10-pins connector on top side.

Table of Contents

1	General Information.....	1
1.1	Overview	1
1.2	Block diagram	1
1.3	Specifications	3
1.4	Ordering Information	4
2	Hardware Information	5
2.1	Board Dimension.....	5
2.2	Board Appearance.....	6
2.3	Dimension with heatsink/heatspreader	7
2.4	Connector and Jumper Location	9
2.5	Connector and Jumper Summary	10
2.6	Pin Assignments & Jumper Settings	10
	J1:JTAG	10
	J2: SATA DOM	10
	J3: SATA DOM Power	11
	J4: Jumper for TV-OUT Enable/Disable (Optional)	11
	J5: Giga Ethernet	11
	X1: PCI, USB & Audio	12
	X2: ISA	13
	X3: VGA, LVDS,TV-OUT, COMx2,PS/2 and Printer	14
	X4: IDE, Ethernet, Power and others	15
2.7	System Mapping.....	16
	Warranty	19

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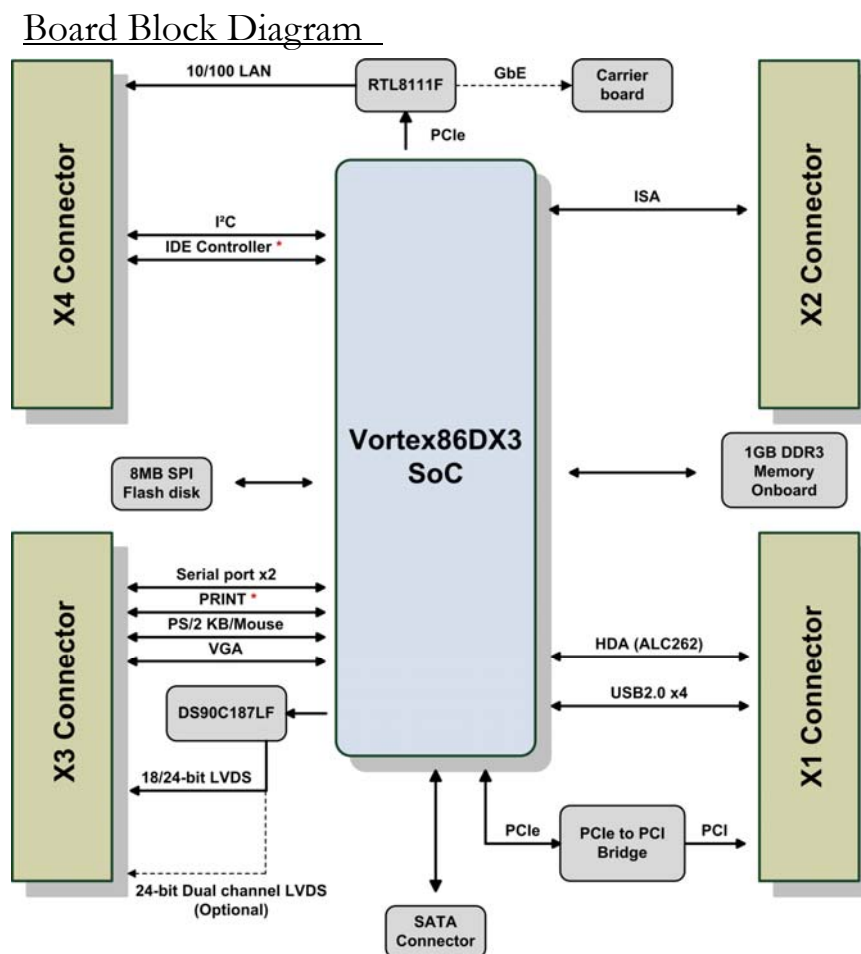
1 General Information

1.1 Overview

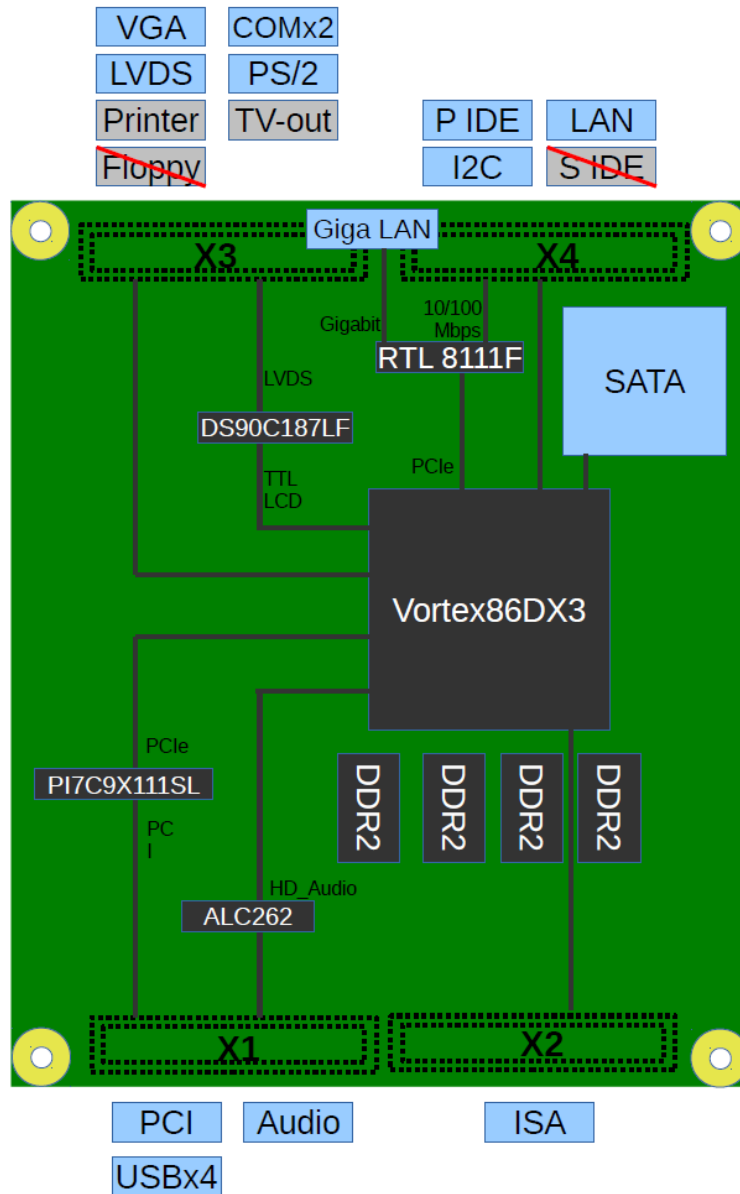
The VDX3-ETX is a low-power CPU module which compliant with ETX standard. It takes the advantage of Vortex86DX 1GHz x86 CPU which integrate the PCIe, IDE, I2C, VGA, LVDS,PS/2, USB, HD Audio and even with 16-bit ISA bus support.

The VDX3-ETX is designed as a plug in replacement, with backward compatibility to support legacy software to help extend existing product life cycle without heavy re-engineering.

1.2 Block diagram



Pinout of X1,X2,X3 and X4 connector



Note:

- Printer** :Optional, due to Vortex86DX3 mux pins limitation, either Primary IDE or Printer can be used at the same time. Default configuration is IDE, please contact ICOP if you need to use Printer.
- TV-out** :Optional,please contact ICOP if you need to use TV-out.
- ~~Floppy~~ :Floppy is not available on this board.
- ~~S IDE~~ :Secondary IDE pins on X4 connector is not available. The Secondary IDE is for SATA on this board.

1.3 Specifications

Processor	DM&P SoC CPU Vortex86DX3 1000Mhz Real Time Clock with Lithium Battery Backup
Cache	L1:32KB I-Cache, 32KB D-Cache, L2 Cache:512KB
Bus	ETX, PCI and ISA
DRAM	1GB/2GB DDR3 Onboard
Watchdog Timer	Software programmable from 30.5 μ sec. to 512 sec. x2 sets
VGA	Integrated 2D VGA chip VGA and TFT/LVDS Flat Panel Interface Support Share system memory 16MB/32MB, Mono, DSTN, STN, TFT Flat Panel Interface support & resolution up to 1920 x 1080, 16M colors
LAN	Realtek 8111F, 10/100/1000Mbps Ethernet x1
Audio	ALC262 (HD Audio)
SPI Flash Disk	Onboard 8MB SPI Flash Disk
Connector	SATA, 7P Connector x1, 2P connector for SATA power x 1. 1000Mbps Ethernet, 10P Connector x 1 X1: PCI, Audio, USBx4 X2: ISA X3: VGA,LVDS,PS/2, COMx2 X4: P_IDE, LAN, I2C (Optional: Printer & TV-out on X2)
Power Requirement	Single Voltage +5V@1200mA. Typical.
Weight	110g
Dimensions	95mm x 114mm (3.7 x 4.5 inches)
Operating Temp.	-20 $^{\circ}$ C ~ +70 $^{\circ}$ C -40 $^{\circ}$ C ~ +85 $^{\circ}$ C (Optional)
Operating System Support	Free DOS, DOS6.22, PCDOS 7.1, DR-DOS, x-DOS, OS/2, Windows CE6.0/7.0, Windows Professional, Windows Embedded Standard (XPE), POS Ready (WePOS), Windosw 7/7Embedded, Embedded Linux, X-Linux, QNX, Vxworks and FreeBSD

1.4 Ordering Information

Board

Item number	Product Description
VDX3-ETX-SL1	1GB DDR3, Printer, -20 to +70°C
VDX3-ETX-SI1	1GB DDR3, IDE, -20 to +70°C
VDX3-ETX-SI1-X	1GB DDR3, IDE, -40 to +85°C

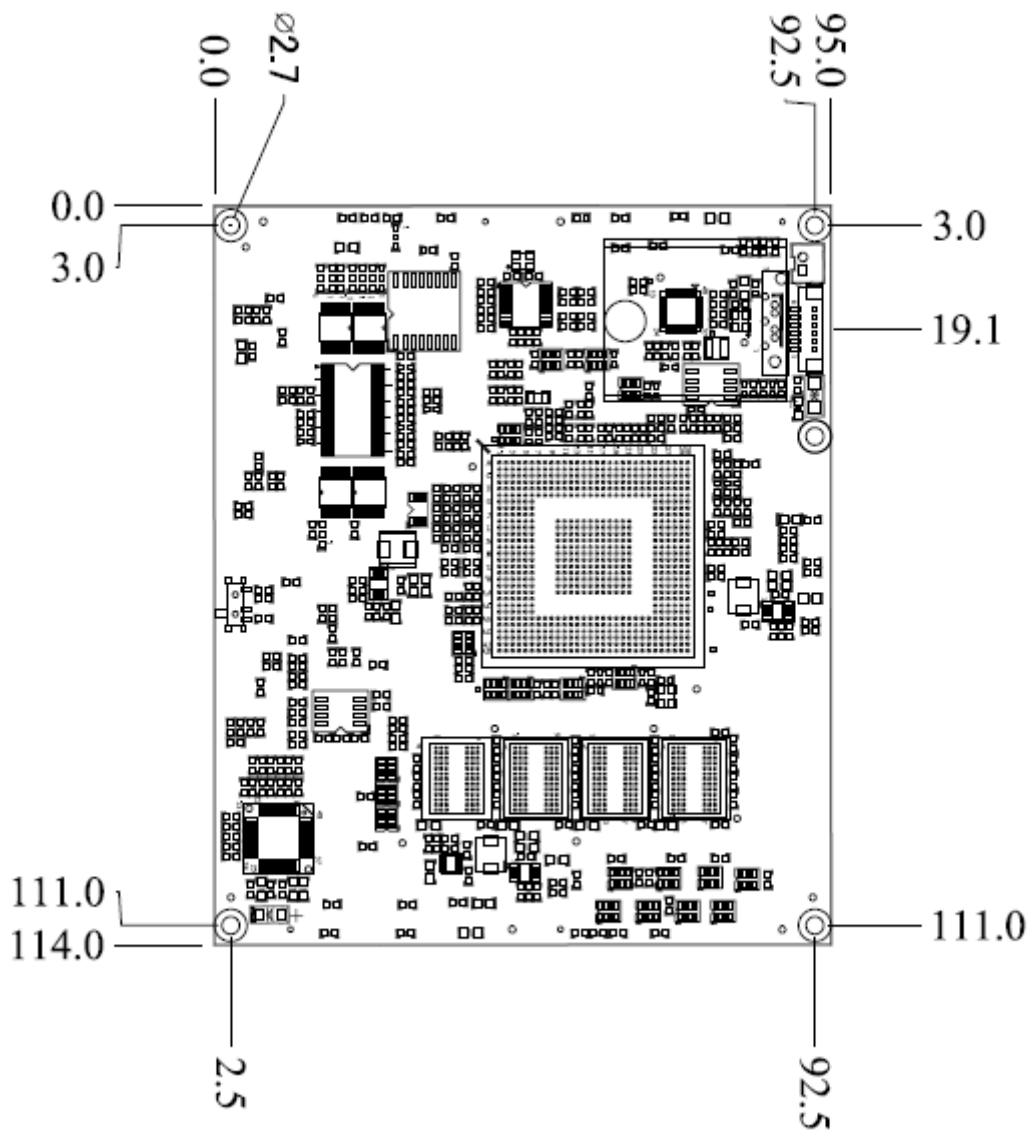
HeatSink. (For detail, please see chapter 2.3)

Item Number	Product Description
Heatspreader-ETX-D3T	2 mm height heatspreader.
Heatsink-ETX-D3T	15 mm height heatsink.

2 Hardware Information

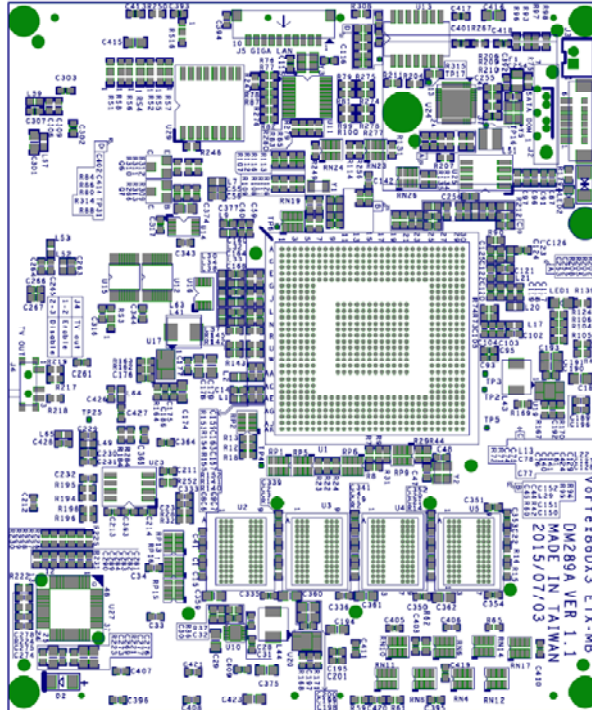
2.1 Board Dimension

Top View

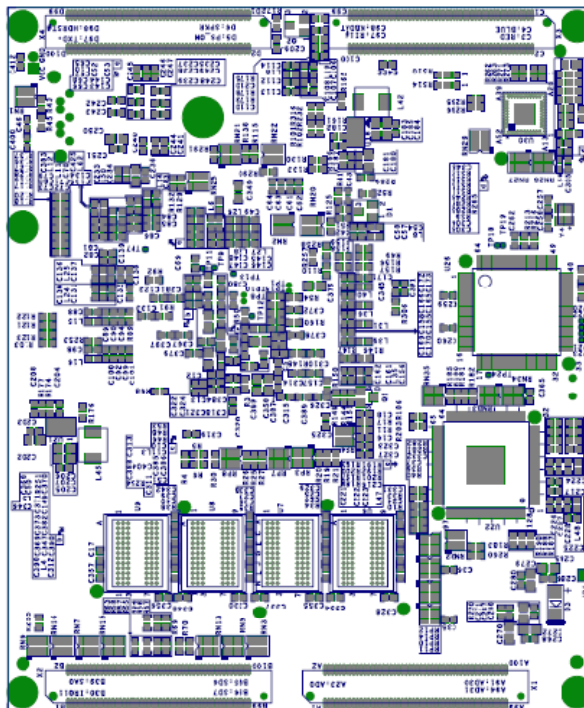


2.2 Board Appearance

Top View

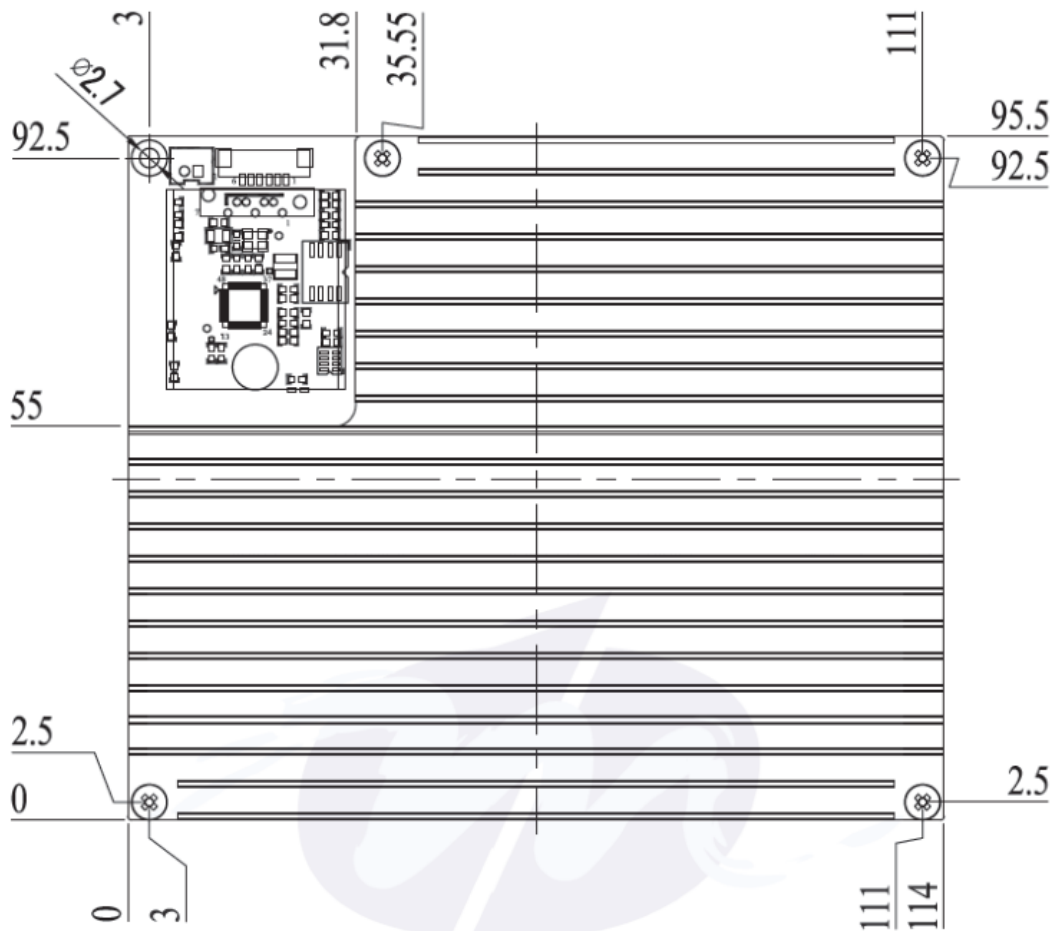


Bottom View

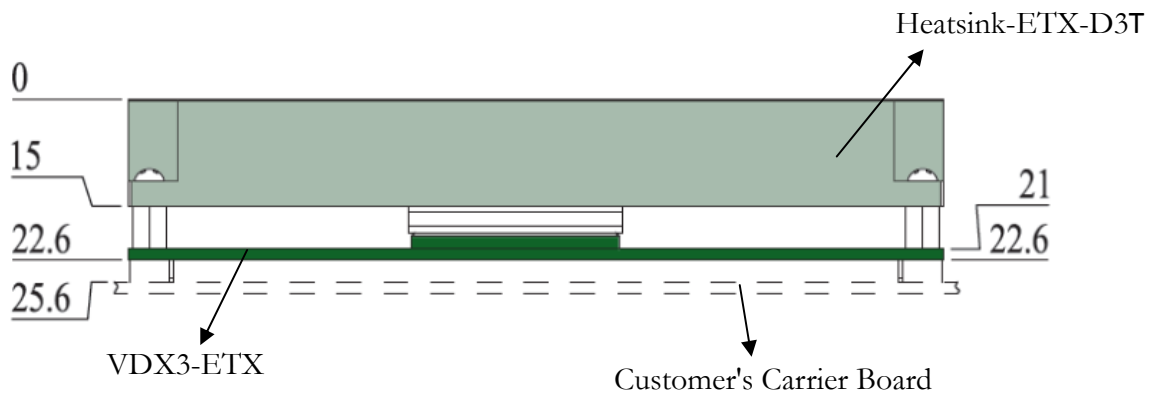


2.3 Dimension with heatsink/heatspreader

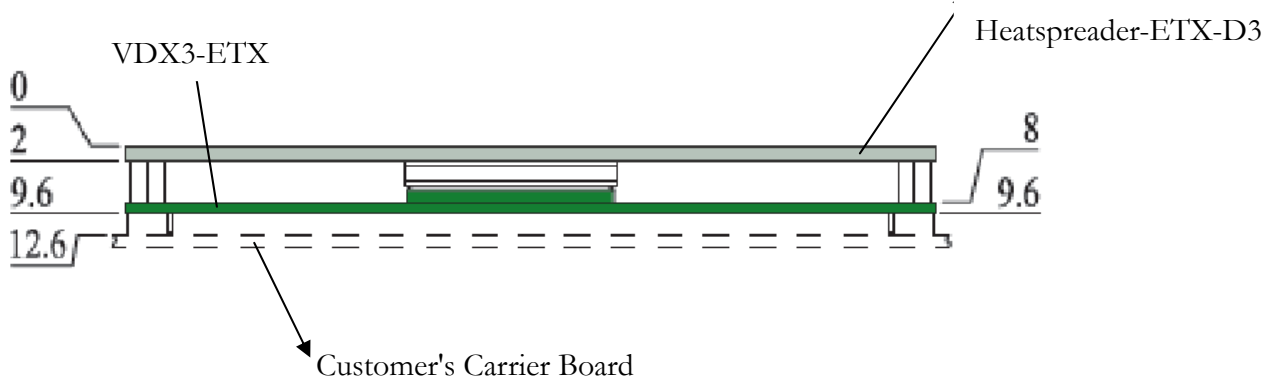
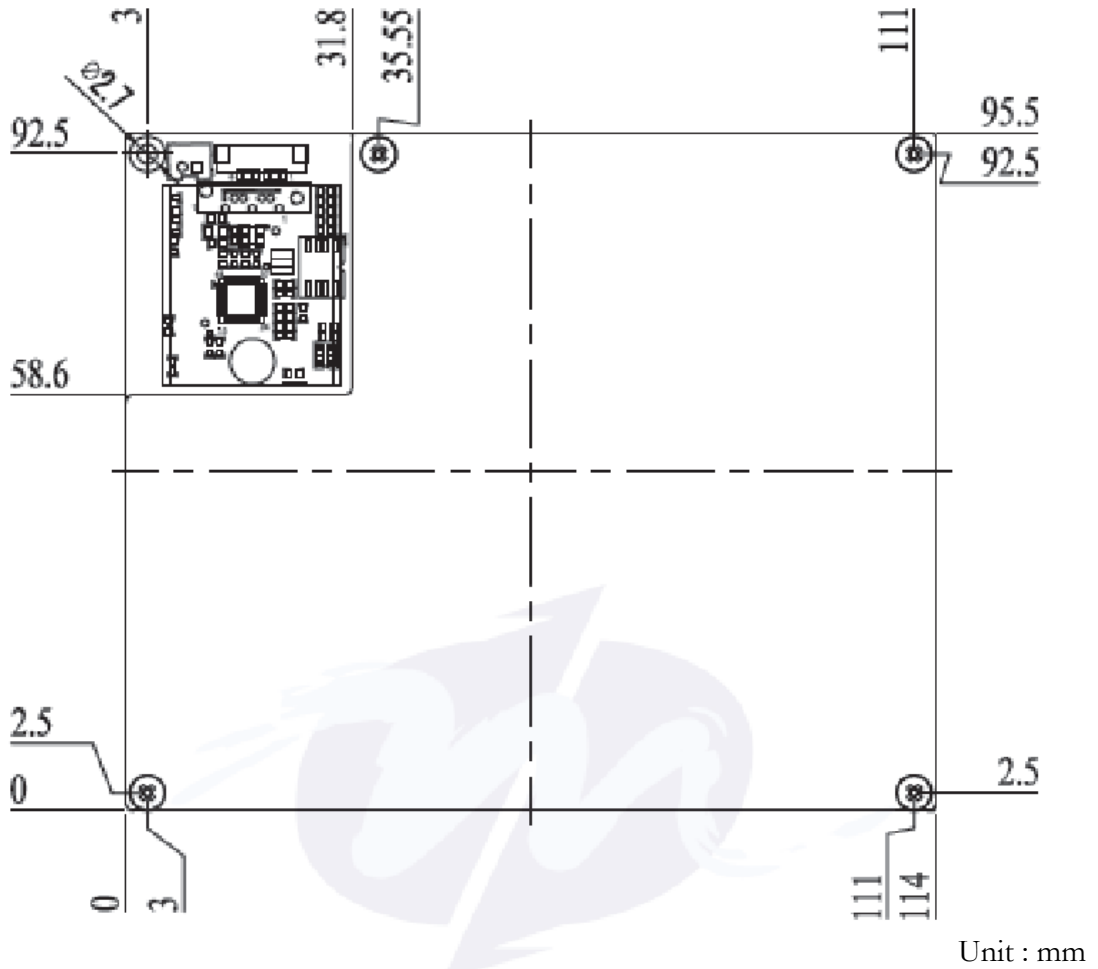
With heatsink (item number: Heatsink-ETX-D3T)



Unit : mm

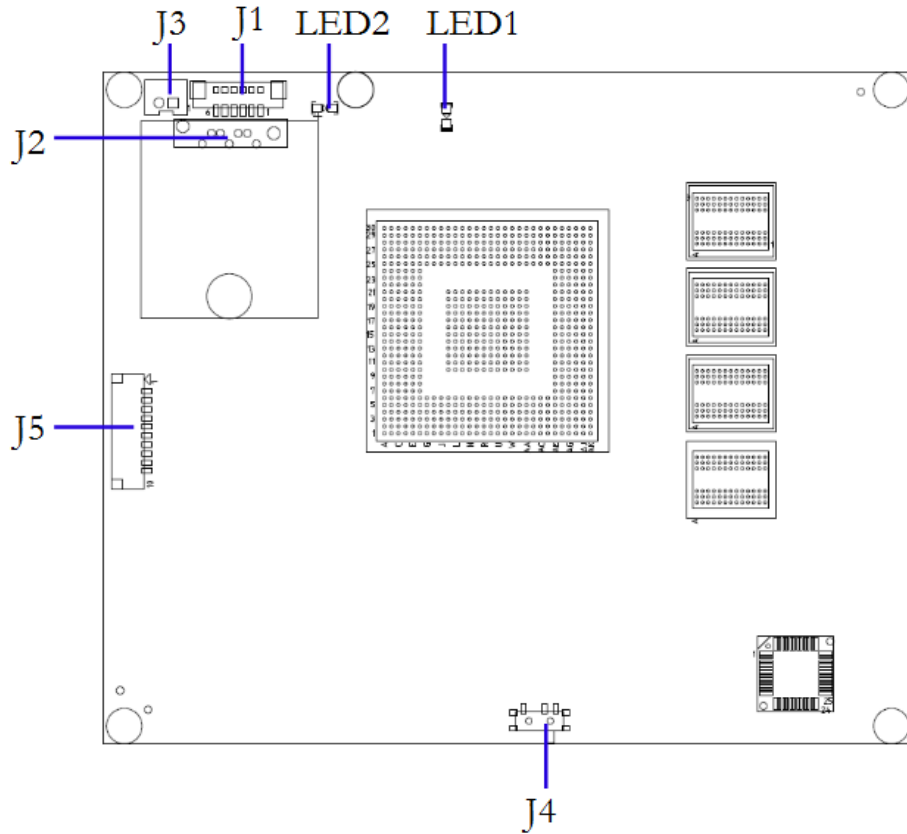


With heatspreader (item number: Heatspreader-ETX-D3T)

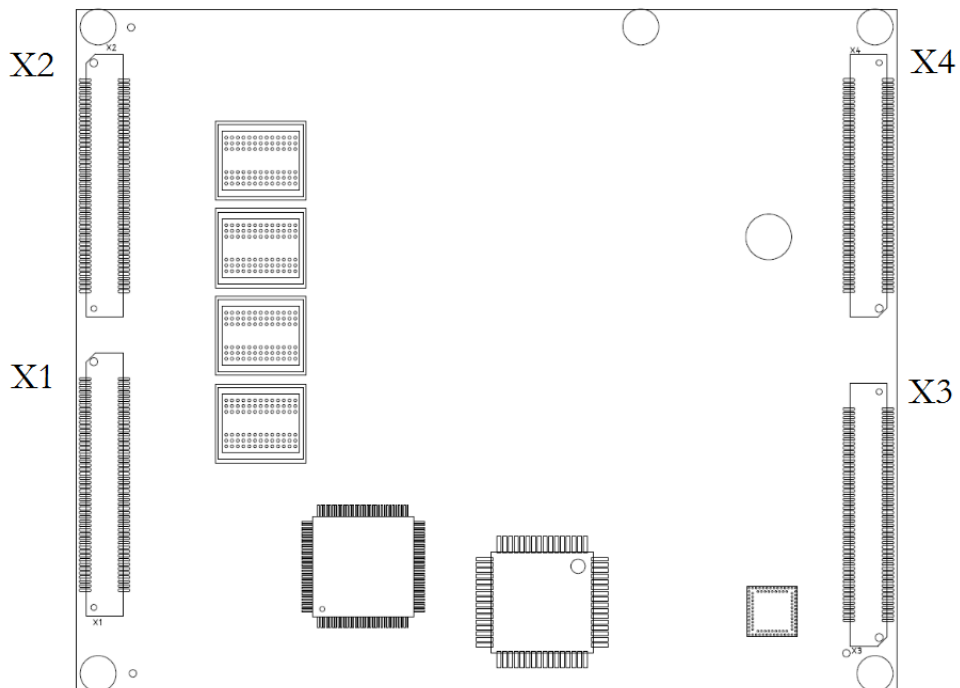


2.4 Connector and Jumper Location

Top View



Bottom View



2.5 Connector and Jumper Summary

Nbr.	Name	Type of Connections	Pin Nbr
J1	JTAG	Pin Header, 1.25, 6x1	6
J2	SATA DOM	SATA 7P Connector, 7x1	7
J3	SATA DOM Power	Box Header, 2.0mm, 1x2	2
J4	TV-OUT Enable/Disable (Optional)	Dip Switch	
J5	Giga Ethernet	Pin Header, 1.25, 10x1	10
LED1	MTBF LED	SMD LED, Orange	/
LED2	Power LED	SMD LED, Red	/
X1	X1 connector	ETX 100 pins connector	100
X2	X2 connector	ETX 100 pins connector	100
X3	X3 connector	ETX 100 pins connector	100
X4	X4 connector	ETX 100 pins connector	100

2.6 Pin Assignments & Jumper Settings

J1:JTAG

The JTAG connector is for Manufacturer to debug, not released.

J2: SATA DOM

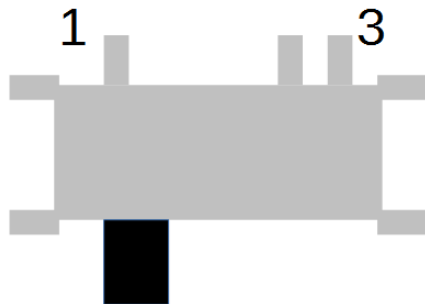
Pin#	Single Name	Pin #	Single Name
1.	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND	/	/

J3: SATA DOM Power

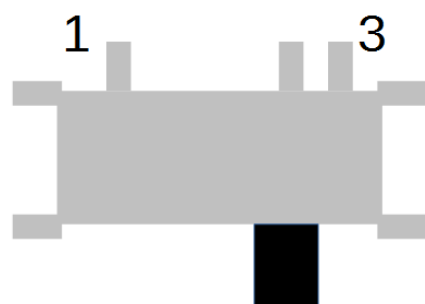
Pin#	Single Name	Pin #	Single Name
1.	VCC	2	GND

J4: Jumper for TV-OUT Enable/Disable (Optional)

Enable

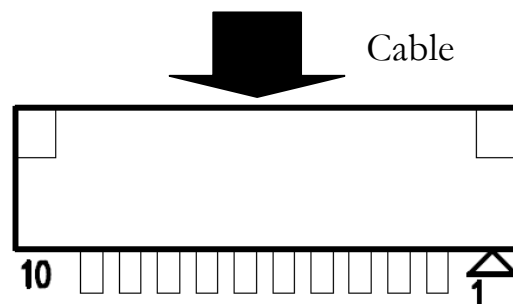


Disable



J5: Giga Ethernet

Pin#	Single Name	Pin #	Single Name
1.	MDI 0+	2	MDI 0-
3	MDI 1+	4	MDI 1-
5	MDI 2+	6	MDI 2-
7	MDI 3+	8	MDI 3-
9	LED1/Link_Active	10	LED/Duplex



X1: PCI, USB & Audio

Pin	Signal	Pin	Signal		Pin	Signal	Pin	Signal
A1	GND	A2	GND		A51	VCC	A52	VCC
A3	PCICLK3	A4	PCICLK4		A53	PAR	A54	SERR*
A5	GND	A6	GND		A55	GPERR*	A56	Reserved
A7	PCICLK1	A8	PCICLK2		A57	PME*	A58	USB2-
A9	REQ3*	A10	GNT3*		A59	LOCK*	A60	DEVSEL*
A11	GNT2*	A12	+3.3V		A61	TRDY*	A62	USB3-
A13	REQ2*	A14	GNT1*		A63	IRDY*	A64	STOP*
A15	REQ1*	A16	+3.3V		A65	FRAME*	A66	USB2+
A17	GNT0*	A18	Reserved		A67	GND	A68	GND
A19	VCC	A20	VCC		A69	AD16	A70	CBE*2
A21	Not supported	A22	REQ0*		A71	AD17	A72	USB3+
A23	AD0	A24	+3.3V		A73	AD19	A74	AD18
A25	AD1	A26	AD2		A75	AD20	A76	USB0-
A27	AD4	A28	AD3		A77	AD22	A78	AD21
A29	AD6	A30	AD5		A79	AD23	A80	USB1-
A31	CBE0*	A32	AD7		A81	AD24	A82	CBE*3
A33	AD8	A34	AD9		A83	VCC	A84	VCC
A35	GND	A36	GND		A85	AD25	A86	AD26
A37	AD10	A38	AUXAL		A87	AD28	A88	USB0+
A39	AD11	A40	MIC		A89	AD27	A90	AD29
A41	AD12	A42	AUXAR		A91	AD30	A92	USB1+
A43	AD13	A44	ASVCC		A93	PCIRST*	A94	AD31
A45	AD14	A46	SNDL		A95	INTC*	A96	INTD*
A47	AD15	A48	ASGND		A97	INTA*	A98	INTB*
A49	CBE1*	A50	SNDR		A99	GND	A100	GND

Note: Pin **A21** is SERIRQ pin in standard ETX, this function is not supported in VDX3-ETX.

X2: ISA

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
B1	GND	B2	GND	B51	VCC	B52	VCC
B3	SD14	B4	SD15	B53	SA6	B54	IRQ5
B5	SD13	B6	Not supported	B55	SA7	B56	IRQ6
B7	SD12	B8	DRQ7	B57	SA8	B58	IRQ7
B9	SD11	B10	DACK7	B59	SA9	B60	SYCLK
B11	SD10	B12	DRQ6	B61	SA10	B62	REFRESH
B13	SD9	B14	DACK6	B63	SA11	B64	DRQ1
B15	SD8	B16	DRQ5	B65	SA12	B66	DACK1
B17	MEMW	B18	DACK5	B67	GND	B68	GND
B19	MEMR	B20	DRQ0	B69	SA13	B70	DRQ3
B21	LA17	B22	DACK0	B71	SA14	B72	DACK3
B23	LA18	B24	IRQ14	B73	SA15	B74	IOR
B25	LA19	B26	IRQ15	B75	SA16	B76	IOW
B27	LA20	B28	IRQ12	B77	SA18	B78	SA17
B29	LA21	B30	IRQ11	B79	SA19	B80	SMEMR
B31	LA22	B32	IRQ10	B81	IOCHRDY	B82	AEN
B33	LA23	B34	IOCS16	B83	VCC	B84	VCC
B35	GND	B36	GND	B85	SD0	B86	SMEMW
B37	SBHE	B38	MEMCS16	B87	SD2	B88	SD1
B39	SA0	B40	OSC	B89	SD3	B90	OWS
B41	SA1	B42	BALE	B91	DRQ2	B92	SD4
B43	SA2	B44	TC	B93	SD5	B94	IRQ9
B45	SA3	B46	DACK2	B95	SD6	B96	SD7
B47	SA4	B48	IRQ3	B97	IOCHCK	B98	RSTDRV
B49	SA5	B50	IRQ4	B99	GND	B100	GND

Note: Pin **B6** is Master#, ISA Bus Master pin, in standard ETX, this function is not supported in VDX3-ETX.


X3: VGA, LVDS,TV-OUT, COMx2,PS/2 and Printer

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
C1	GND	C2	GND	C51	LPT/FLPY#	C52	Reserved
C3	Red	C4	Blue	C53	VCC	C54	GND
C5	HSYNC	C6	Green	C55	STB	C56	AFD
C7	VSYNC	C8	DDCCLK	C57	Reserved	C58	PD7
C9	DETECT	C10	DDCDAT	C59	Not supported	C60	ERROR
C11	TXLCK1-	C12	TXOUT13-	C61	Not supported	C62	PD6
C13	TXLCK1+	C14	TXOUT13+	C63	RXD2	C64	INIT
C15	GND	C16	GND	C65	GND	C66	GND
C17	TXOUT11+	C18	TXOUT12+	C67	RTS2	C68	PD5
C19	TXOUT11-	C20	TXOUT12-	C69	DTR2	C70	SLIN
C21	GND	C22	GND	C71	DCD2	C72	PD4
C23	TXOUT3-	C24	TXOUT10+	C73	DSR2	C74	PD3
C25	TXOUT3+	C26	TXOUT10-	C75	CTS2	C76	PD2
C27	GND	C28	GND	C77	TXD2	C78	PD1
C29	TXOUT2-	C30	TXCLK+	C79	RI2	C80	PD0
C31	TXOUT2+	C32	TXCLK-	C81	VCC	C82	VCC
C33	GND	C34	GND	C83	RXD1	C84	ACK
C35	TXOUT0+	C36	TXOUT1+	C85	RTS1	C86	BUSY
C37	TXOUT0-	C38	TXOUT1-	C87	DTR1	C88	PE
C39	VCC	C40	VCC	C89	DCD1	C90	SLCT
C41	Not supported	C42	Not supported	C91	DSR1	C92	MSCLK
C43	Not supported	C44	Not supported	C93	CTS1	C94	MSDAT
C45	BIASON	C46	Not supported	C95	TXD1	C96	KBCLK
C47	B-CVBS	C48	G-CVBS	C97	RI1	C98	KBDAT
C49	Not supported	C50	R-CVBS	C99	GND	C100	GND

Note:

-Pin C41,C43 (I2C for LCD), C42,C44,C46,C49 (LCD control pins),C59 & C61 (IrDA) are not supported in VDX3-ETX.

-  :First Channel LVDS.

-  :Second Channel LVDS.

X4: IDE, Ethernet, Power and others

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
D1	GND	D2	GND	D51	Not supported	D52	PIDE_IOR
D3	5V_SB	D4	PWGIN	D53	Not supported	D54	PIDE_IOW
D5	PS_ON#	D6	SPEAKER	D55	Not supported	D56	PIDE_REQ
D7	PWRBTN#	D8	BATT	D57	Not supported	D58	PIDE_D15
D9	Not supported	D10	L_DUPLEX	D59	Not supported	D60	PIDE_D0
D11	Not supported	D12	L_LINK/Active	D61	Not supported	D62	PIDE_D14
D13	Not supported	D14	Not supported	D63	Not supported	D64	PIDE_D1
D15	Not supported	D16	I2CLK	D65	GND	D66	GND
D17	VCC	D18	VCC	D67	Not supported	D68	PIDE_D13
D19	Not supported	D20	GPCS0	D69	Not supported	D70	PIDE_D2
D21	Not supported	D22	I2DAT	D71	Not supported	D72	PIDE_D12
D23	Not supported	D24	Not supported	D73	Not supported	D74	PIDE_D3
D25	Not supported	D26	Not supported	D75	Not supported	D76	PIDE_D11
D27	Not supported	D28	Not supported	D77	Not supported	D78	PIDE_D4
D29	Not supported	D30	PIDE_CS1	D79	Not supported	D80	PIDE_D10
D31	Not supported	D32	PIDE_CS0	D81	VCC	D82	VCC
D33	GND	D34	GND	D83	Not supported	D84	PIDE_D5
D35	Not supported	D36	PIDE_A2	D85	Not supported	D86	PIDE_D9
D37	Not supported	D38	PIDE_A0	D87	Not supported	D88	PIDE_D6
D39	Not supported	D40	PIDE_A1	D89	Not supported	D90	P_IDE_CBLID
D41	Not supported	D42	Not supported	D91	LAN_RXD-	D92	PIDE_D8
D43	Not supported	D44	PIDE_INT	D93	LAN_RXD+	D94	SIDE_D7
D45	Not supported	D46	PIDE_ACK	D95	LAN_TXD-	D96	PIDE_D7
D47	Not supported	D48	PIDE_RDY	D97	LAN_TXD+	D98	PIDE_RST
D49	VCC	D50	VCC	D99	GND	D100	GND

Note:

-The **Not supported** pins are Secondary IDE pin, SM Bus and Power Management pins.

2.7 System Mapping

Memory Mapping		
Address	Description	Usage
00000000 – 0009FFFF	System RAM	*
000A0000 – 000AFFFF	EGA/VGA Video Memory	*
000B0000 – 000B7FFF	MDA RAM, Hercules graphics display RAM	*
000B8000 – 000BFFFF	CGA display RAM	*
000C0000 – 000C7FFF	EGA/VGA BIOS ROM	*
000C8000 – 000CFFFF	Boot ROM enable	
000CC000 – 000CFFFF	Console Redirection enable	
000D0000 – 000D7FFF	Expansion ROM space	
000D8000 – 000D8FFF	SPI Flash Emulation Floppy A Enable	
000DC000 – 000DFFFF	Expansion ROM Space	
000E0000 – 000EFFFF	USB Legacy SCSI ROM space	
000F0000 – 000FFFFFFF	Motherboard BIOS	*
FEBDE000 – FEBDE0FF	Standard OpenHCD USB Host Controller	*
FEBDFC00 - FEBDFCFF	Onboard Ethernet Adapter	*

I/O Mapping		
Address	Description	Usage
00000h – 000Fh	DMA 8237-1	*
0010h – 0017h	COM9	
0020h – 0021h	PIC 8259-1	*
0022h – 0023h	Indirect Access Register (6117D configuration port)	*
002Eh – 002Fh	Forward to LPC BUS	
0040h – 0043h	Timer Counter 8254	*
0048h – 0048h	PWM Counter 8254	*
004Eh – 004Fh	Forward to LPC BUS	
0060h	Keyboard/Mouse data port	*
0061h	Port B + NMI control port	*
0062h – 0063h	8051 download 4k address counter	*
0064h	Keyboard/Mouse status/command port	*
0065h	Watchdog0 reload counter	*
0066h	8051 download 8bit data port	*
0067h	Watchdog1 reload counter	*

0068h – 006Dh	Watchdog1 control counter	*
0070h – 0071h	CMOS RAM port	*
0072h – 0075h	MTBF control register	**
0078h – 007Ch	GPIO port 0,1,2,3,4 default setup	*
0080h – 008Fh	DMA page register	*
0092h	System control register	*
0098h – 009Ch	GPIO direction control	*
00A0h – 00A1h	PIC 8259-2	*
00C0h – 00DFh	DMA 8237-2	*
00E0h – 00EFh	DOS 4G Page access	*
0170h – 0177h	IDE1(IRQ15)	
001F0 – 01F7h	IDE0(IRQ14)	*
0220h – 0227h	COM8 Forward to LPC BUS	
0228h – 022Fh	COM7 Forward to LPC BUS	
0238h – 023Fh	COM6 Forward to LPC BUS	
0278h – 027Fh	Printer port (IRQ7, DMA 0)	*
0040h – 0043h	Timer Counter 8254	*
0048h – 0048h	PWM Counter 8254	*
004Eh – 004Fh	Forward to LPC BUS	
0060h	Keyboard/Mouse data port	*
0061h	Port B + NMI control port	*
0062h – 0063h	8051 download 4k address counter	*
0064h	Keyboard/Mouse status/command port	*
0065h	Watchdog0 reload counter	*
0066h	8051 download 8bit data port	*
0067h	Watchdog1 reload counter	*
0068h – 006Dh	Watchdog1 control counter	*
0070h – 0071h	CMOS RAM port	*
0072h – 0075h	MTBF control register	*
0078h – 007Ch	GPIO port 0,1,2,3,4 default setup	*
0080h – 008Fh	DMA page register	*
0092h	System control register	*
0098h – 009Ch	GPIO direction control	*
00A0h – 00A1h	PIC 8259-2	*
00C0h – 00DFh	DMA 8237-2	*
00E0h – 00EFh	DOS 4G Page access	*
0170h – 0177h	IDE1(IRQ15)	

01F0h – 01F7h	IDE0(IRQ14)	*
0220h – 0227h	COM8 Forward to LPC BUS	
0228h – 022Fh	COM7 Forward to LPC BUS	
0238h – 023Fh	COM6 Forward to LPC BUS	
0278h – 027Fh	Printer port (IRQ7, DMA0)	*

IRQ Mapping		
Address	Description	Usage
IRQ0	System Timer	*
IRQ1	Keyboard Controller	*
IRQ2	Cascade for IRQ8~15	
IRQ3	Serial port 2	*
IRQ4	Serial port 1	*
IRQ5	USB	*
IRQ6	USB	
IRQ7	USB/Ethernet 10/100M LAN	*
IRQ8	Real Timer Clock	*
IRQ9	Multimedia Device	*
IRQ10	Serial Port 3	*
IRQ11	Serial Port 4	*
IRQ12	Mouse	*
IRQ13	Math Coprocessor	*
IRQ14	Hard Disk Controller #1	*
IRQ15	Hard Disk Controller #2	*

Warranty

This product is warranted to be in good working order for a period of one year (12 months) from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it without additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise is accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description. Should you have questions about warranty and RMA service, please contact us directly.