

## CRD

The CRD is a conduction-cooled 6U single-slot Compact PCI (PCMG 2.16 compatible) platform based on the Intel® Core™2 Duo Mobile Processor L7400 at 1.5 GHz or the T7400 running at 2.16 GHz. The CRD takes advantage of the Core2Duo's low power consumption (17W at 1.5 GHz) as a rugged Single Board Computer (SBC), and it is optionally available as a conduction-cooled Compact PCI module with wedge locks and a full-board heat sink for high shock/vibration environments and temperature extremes. For the conduction-cooled version, see CRD..

The E7520 Memory Controller Hub (MCH) and 6300ESB I/O Controller Hub (ICH) chipset supports PCI-X and PCIe expansion, USB 2.0, ATA/100, and Serial ATA (SATA). Two Gb Ethernet ports and two USB 2.0 ports are accessible from the front panel in addition to two PMC bezels. On-board CompactFlash permits single-slot booting. Two PICMG 2.16-compliant, 10/100/1000BaseTX ports are routed to the backplane. Two SATA ports, VGA video, up to four COM ports, an optional IDE interface, PS/2 mouse & keyboard, and two more USB 2.0 ports are routed to the backplane. Two PMC-X site is provided for additional I/O expansion. One of the sites is XMC compatible and supports x8 PCIexpress. Conventional PC I/O is accessible with industry-standard connectors on optional rear I/O modules.

**Core™2 Duo Mobile Processor**

L7400 1.5 GHz, 479-pin uFC-BGA Core 2 Duo  
manufactured with low-power 65 nm process  
T7400 2.16 GHz Core2 Duo version also available  
4 MB L2 Cache  
667 MHz front side bus  
64-bit OS and application support

**Single-slot Operation**

Single-slot CompactPCI operation with an on-board  
CompactFlash disk for bootable mass storage

**E7520 & 6300ESB Chipset**

Two x4 PCI Express interfaces are routed to two dual Gb  
Ethernet controllers  
One x8 PCI Express interfaces is routed to an XMC site  
DDR2-400 DRAM interface with a max memory band  
width of 6.4 GB/second  
Four USB 2.0 Ports  
PATA/100 and SATA/150 support  
PCI-X 64/66 for the two PMC sites

**DRAM**

2 or 4 GBytes of DDR2-400 memory  
Two banks that are each 64 bits wide with ECC support

**CompactPCI**

PICMG 2.0 R3.0 Compliant  
PLX non-transparent PCI-PCI bridge provides 64-bit  
CompactPCI transfer rates at 66 MHz  
Universal bridge lets the CPD operate as a system  
controller or a peripheral slot module  
Supports Hot Swapping according to PICMG 2.1 R2.0  
Connectors J3 and J5 are used for I/O expansion

**PMC Expansion**

Two PMC sites based upon PCI-X bus with 64-bit  
66 MHz  
One of PMC sites also supports XMC modules with x8  
PCIe

**Ethernet/PICMG 2.16**

Two Intel 82571EB dual PCI express Ethernet controllers  
provides a total of four 10/100/1000BaseTX ports.  
Two ports routed to the J3 connector in compliance with  
PICMG 2.16 for back plane fabric switching or for  
alternate routing to an optional rear I/O card  
Two ports are optionally routed through front cold plate

**Graphics**

The Silicon Motion SM 712 ultra low-power display  
controller with 4 MB on-chip memory  
VGA routed to J5

**IDE/CompactFlash**

Primary ATA/100 DMA IDE interface is optionally  
accessible from the J5  
Secondary IDE port is routed to a Type II-compatible  
CompactFlash connector for on-board booting

**BIOS**

General Software's flash-based system BIOS with a  
variety of boot options including CD-ROM, USB, and  
PXE over Ethernet  
Customized versions can be provided

**Watchdog**

Programmable watchdog timer for system recovery

**I/O interfaces accessible from the front**

Conduction-cooled cold plates normally preclude front  
panel I/O. CRD, however, includes option of dual  
10/100/1000BaseTX, routed through front cold plate

**I/O interfaces routed to optional rear plug-in board**

VGA, IDE, COM1/2/3/4, dual Serial ATA, keyboard,  
mouse, and dual USB 2.0 ports (routed through J5)  
Two Gb Ethernet ports in compliance with PICMG 2.16  
(routed through J3)  
Access to both PMC sites

**Rear Transition Module**

XPDRIO rear I/O interface board with standard  
connectors for all I/O routed to rear

**Operating temperature**

The CPD1 has a standard operating temperature range of  
0°/+70° C  
Extended temp versions to -40°/+85°C are available

**Rugged/Conduction-cooled Versions**

CRD is a conduction-cooled version of the CPD  
Stiffener bar enables high shock/vibration immunity per  
MIL-STD-810F  
Convection-cooled and conduction-cooled versions have  
conformal coating as an option

**Net Weight**

Approximately 15 oz



**Core™2 Duo Mobile Processor L7400 or T7400**

Delivering breakthrough energy efficient performance for embedded platforms. 65 nm process technology makes it possible to integrate two complete execution cores in one physical package, providing advancements in simultaneous computing for multi-threaded applications and multi-tasking environments. While incorporating advanced processor technology this processor remains software compatible with previous IA-32 processors. Executes four instructions per cycle to improve execution speed and efficiency using 14-stage pipeline. Supports 64-bit instructions, providing flexibility for 64-bit and 32-bit applications and operating systems.

**E7520 Memory Controller Hub**

The Intel E7520 chipset acts as the central hub for all data passing between the core system elements including processor, memory, PCI Express I/O, and legacy I/O subsystems.

**DRAM**

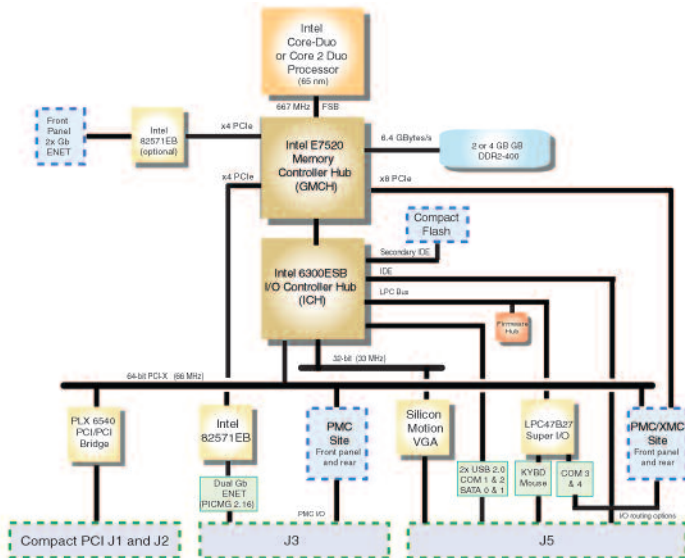
The CPD supports 2 or 4 GBytes of DRAM and its DDR2-400 memory technology is ideal for memory-intensive applications, providing up to 20 percent increase in memory bandwidth, and up to 40 percent decrease in power consumption over DDR 266 memory. The memory subsystem interface to E7520 is dual channel, supporting two registered DIMMs per channel—depending on memory technology—for a total system bandwidth of up to 6.4 GB/second. ECC error correction is supported.

**Environmental Specification**

Temperature			
	Operating	0°C-70°C	Wider temperature ranges may require some processor slowing
	Storage	-55°C to 125°C	
Humidity			
	Operating	0 to 95% non-condensing	± 4% relative humidity, per MIL-STD-810F
	Storage	0 to 100% non-condensing	
Altitude			
		Unlimited	Air cooled cards must have adequate cooling
Vibration			
	Sine	10 g peak 15-2 kHz	All levels based on a sweep duration of ten minutes per axis, each of three mutually perpendicular axes. Qualification testing is displacement limited below 44 Hz.
	Random	0.1 g <sup>2</sup> /Hz 15-2 kHz (14.1 grms)	60 minutes per axis each of three mutually perpendicular axes.
	Shock	40 g peak	Three hits per direction per axis, ½ sine + terminal peak sawtooth, 11 ms (total 36 hits).

### CPD I/O Routing

I/O	Front Panel	Through J3	Through J5
PS/2 Mouse/Kybd			1
1 Gb LAN (4 total)	2 (optional)	2 (PICMG 2.16)	
COM ports			2 + 2 (optional)
VGA Graphics			1
USB 2.0			2
Serial ATA			2
IDE Interface			1 (optional)
PMC I/O		1	1(PMC/XMC (optional))



#### Ordering Information:

Part#	Description
CRDxRS	Conduction-cooled CompactPCI single-slot processor with 1.5 GHz Core2-Duo, 2 GB DDR-400. With CompactPCI, PICMG 2.16, IPMI. With no CompactFlash installed. With wedgelocks and stiffener bars.
xxxxQxx	256 MB Flash for CRD
xxxxRxx	512 MB Flash for CRD
xxxxSxx	1 GB Flash for CRD
xxxxTxx	2 GB Flash for CRD
xxxxUxx	4 GB Flash for CRD
xxxxVxx	8 GB Flash for CRD
xxxxWxx	16 GB Flash for CRD
xxxxSx	Upgrade to 4 GB DDR2-400
xxxxxT	Upgrade to 2.16 GHz Core2 Duo T7400
xxxxxxx-ER	Extended operating temperature
CONCOAT	Conformal coating option
XPDDRIO	Optional rear I/O interface board with: <ul style="list-style-type: none"> <li>• USB connector</li> <li>• 40-pin IDE connector</li> <li>• Two RJ-45 connectors for Gb Ethernet</li> <li>• Two SATA connectors</li> <li>• COM 1,2,3,4 connector (two are MDSM)</li> <li>• PS/2 keyboard mouse</li> </ul>