

**Venture Development Corporation
Embedded Hardware and
Systems Practice**



A White Paper On:

***2004 MERCHANT COMPUTER BOARDS FOR
EMBEDDED/REAL-TIME APPLICATIONS
INTELLIGENCE PROGRAM***

Volume V

Global Embedded Merchant Board Market Overview and Outlook

Prepared by:

J. Eric Gulliksen

Embedded Hardware and Systems Practice

Venture Development Corporation

April 2005

All rights reserved

INTRODUCTION

This white paper provides a summary of findings extracted from Venture Development Corporation's recently published Overview of the Merchant Embedded Computer Board industry, Volume V of VDC's five-volume ***Merchant Computer Boards for Embedded/Real-Time Applications Market Intelligence Program***.

This comprises a summary of high-level findings from the various reports in the program, including:

- Volume I – *Slot Single Board Computers and Embedded CPU Blades*
- Volume II – *Embedded Motherboards*
- Volume III: *Mezzanine Cards and Computers-on-Modules*
- Volume IV: *Stackables*

This report includes:

- Top level market sizes and forecasts through year 2008
- Selected granular current market sizes and forecasts for 2006
- Brief discussion of market and technological trends
- Platinum and Gold Vendor Awards
- Observations and recommendations

SUMMARY OF FINDINGS

Overall Market

Exhibit 1
Total Global Market for Embedded Boards
(US\$ in Millions)

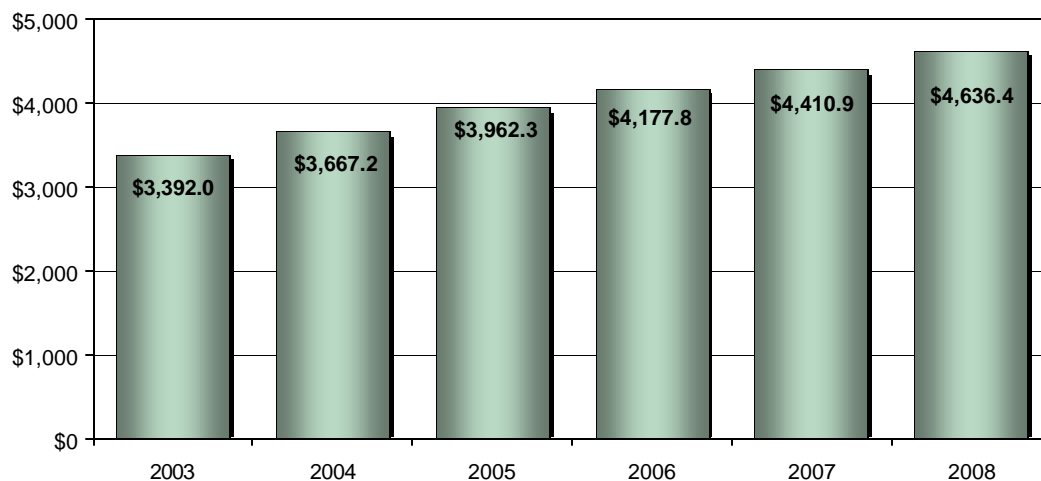
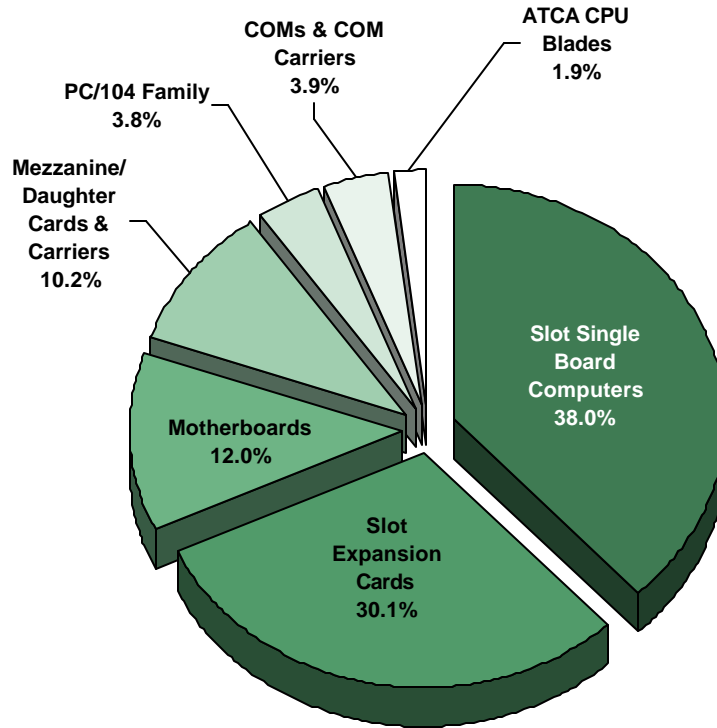


Exhibit 2
Global Embedded Board Shipments segmented by Platform, 2004 & 2008

2004 Total: US\$ 3668 Million



2008 Total: US\$ 4636 Million

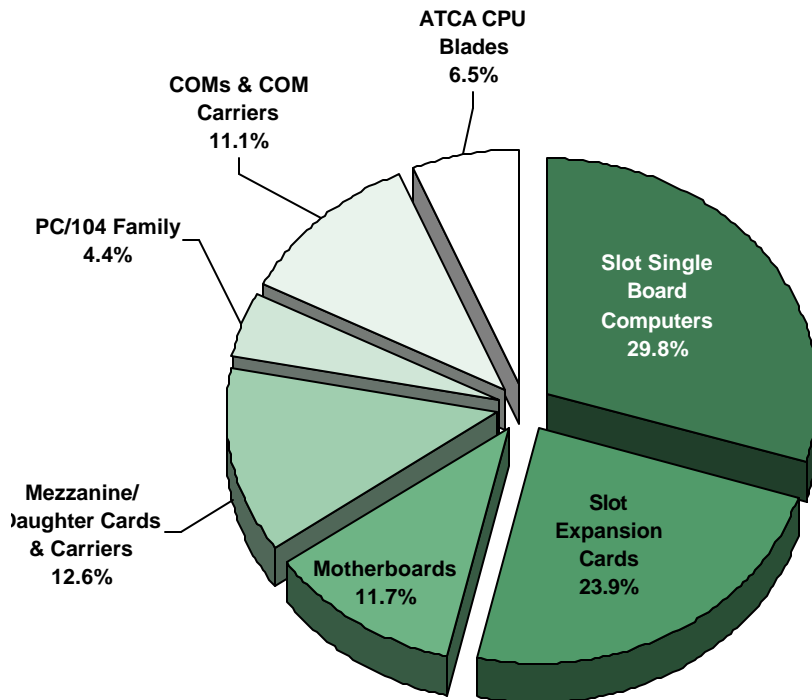
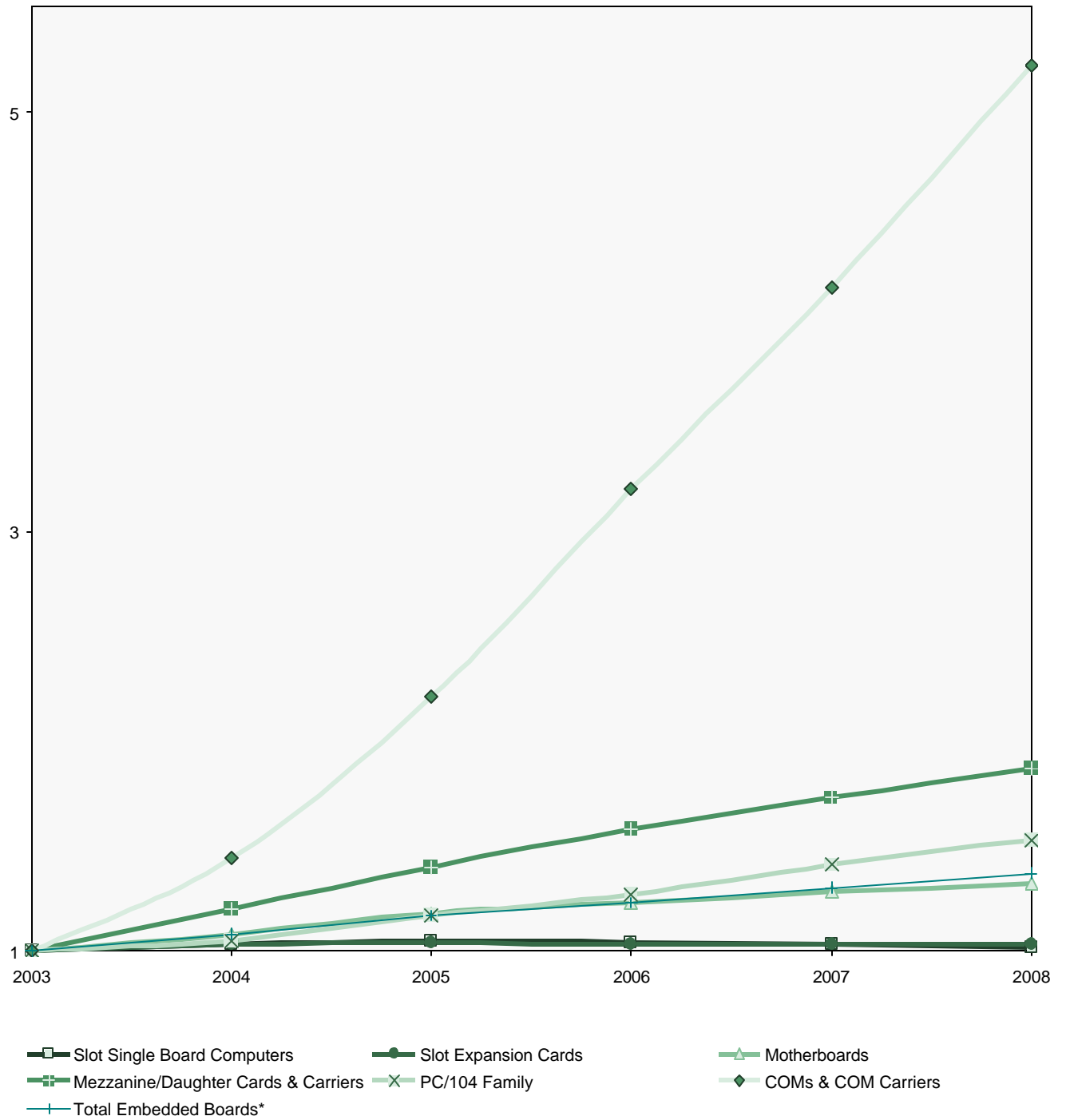


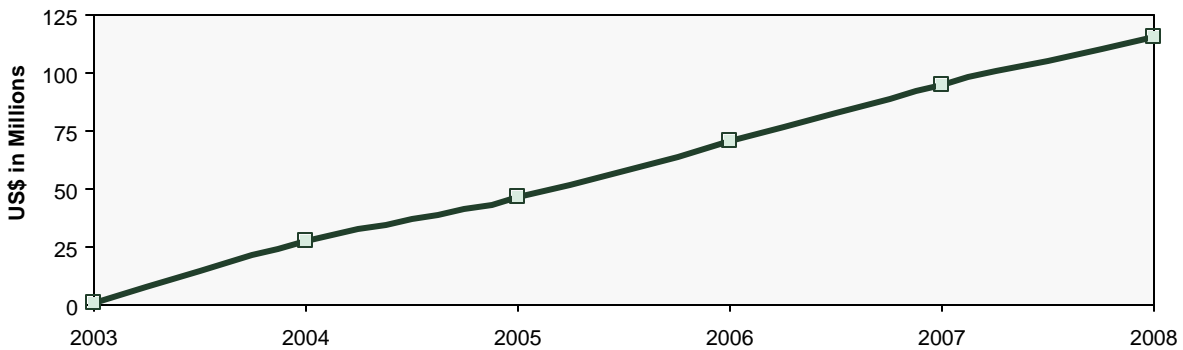
Exhibit 3
 Normalized Embedded Board Growth Curves by Platform, 2003-2008
 (Dollar Volume Shipments Normalized to Year 2003 Values)



* Note: Total includes ATCA CPU Blades

These exhibits demonstrate that, as a whole, the embedded board market is both healthy and growing. They also indicate that most market growth is in embedded motherboards and other, somewhat less traditional platforms such as mezzanine cards, PC/104 modules and COMs rather than with conventional passive backplane slot cards. The exception to the above is the emerging ATCA blade architecture, which is expected to show significant growth.

Exhibit 4
 ATCA CPU Blades, Normalized Growth Curve, 2003-2008
 (Dollar Volume Shipments Normalized to Year 2003 Value)



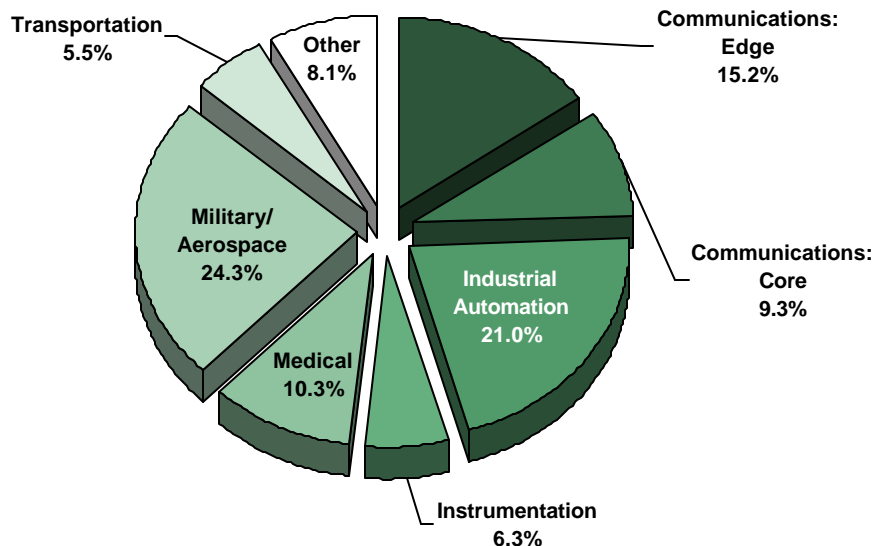
Note that certain types of boards have been excluded from the exhibits and discussion that follows. These include:

- Slot Expansion Cards;
- Non-CPU ATCA Blades; and
- Standard consumer/SOHO motherboards that may be used in embedded applications.

Vertical Markets

Exhibit 5
 Global Embedded Board Shipment Shares by Vertical Market, 2004
 (% of Dollar Volume Shipments)

Total Shipments: US\$ 2,516 Million



When “core” and “edge” applications are combined, the communications market represented nearly a quarter of board shipments in 2004. This comprises the largest vertical market for embedded computer boards, but represents a substantially lower share than that projected for 2003 in VDC’s most recent prior report. This is due to three factors:

- Certain growth drivers such as VoIP and Video-on-Demand have not been adopted as rapidly as had been expected;
- Service providers are largely in a “maintenance” mode awaiting “pull” from the marketplace; and
- Military/Aerospace continues to consume a far larger share than that projected for 2003 due to the ongoing strife in Iraq and Afghanistan.

We expect the military/aerospace/defense market, which currently comprises the second largest vertical market segment, to show a significant decline in share in 2006, as the aforementioned conflicts draw to a close. Overall market growth, however, will more than offset this decline. Other changes in shares are projected to comprise incremental increases.

Slot Single Board Computers

Overall, the market for slot SBCs, including ATCA CPU Blades, is expected to grow by 15% between 2004 and 2008. However, VDC expects shipments of VME SBCs to decline by about 12% over this period. Shipments of CompactPCI SBCs are expected to surpass those of VME in 2005. Shipments of PCI-ISA SBCs, primarily constituting PICMG 1.0 configurations, are expected to grow by more than 20% over this period, and those of PCI SBCs are also expected to increase.

Embedded Motherboards

Shipments of “Embedded Form Factor” motherboards, including the 3.5”, 5.25”, EBX and EPIC form factors, are expected to show stronger growth between 2004 and 2008 than those of “Desktop Form Factor” boards (ATX and derivatives), but VDC anticipates that both types will grow by more than 19% over this period.

Mezzanine Cards and Carriers

The mezzanine/daughter card space is dominated by PMC, which represented more than 60% of dollar volume shipments during 2004. Shipments of these, and of other/proprietary architecture mezzanines and daughter cards, are both expected to have grown by more than 40% by the end of 2008. AMC cards and carriers will show explosive growth over this period, growing from a negligible share in 2004 to nearly 10% in 2008. Much of this growth will be due to the new MicroTCA architecture.

Computers-on-Modules (COMs) and COM Carriers

Shipments of COMs and COM carriers, as a whole, are expected to increase by more than 250% over the 2004-2008 period. This space is currently dominated by the ETX form factor, which commands a shipment share greater than 38%. The new COM Express form factor and architecture is expected to grow very rapidly. These represented less than 3% of total COM and carrier shipments in 2004, but will represent a year 2008 share greater than 16%.

PC/104 Family Modules

PC/104 family module shipments are expected to grow nicely, increasing by more than 45% over the 2004-2008 period. The most rapid growth is expected to be in the PCI-104 architecture. At present, PCI-104 commands only a 5% share. Shipments of these are expected to more than triple, resulting in a 2008 share greater than 13% of the total.

Within the total PC/104 family, CPU modules comprise the dominant functional type. These represented a 64% shipment share in 2004, which is expected to remain relatively constant through 2008.

Market Share Leaders

Exhibit 6 Market Share Leaders, 2004
<u>Total Embedded Boards Investigated</u> Embedded Communications Computing (ECC)*
Slot SBCs and Embedded CPU Blades Embedded Communications Computing (ECC)*
"Desktop" Form Factor Embedded Motherboards Sun Microsystems
"Embedded" Form Factor Embedded Motherboards Advantech Co., Ltd.
PC/104 Family Modules Arcom Controls
Mezzanine/Daughter Cards and Carriers Mercury Computer Systems, Inc.**
Computers-on-Modules (COMs) Kontron AG***
* Formed by the merger of Motorola Computer Group and Force Computers ** Including Momentum Computers *** Including Gespac (Europe)

“PLATINUM” CLASS MERCHANT BOARD VENDORS

VDC is pleased to announce that the following vendors of Merchant Embedded Computer Boards achieved Platinum status for their service to the industry in 2004-2005:



ACS-TECH80
CURTISS-WRIGHT CONTROLS EMBEDDED COMPUTING (CWCEC)
EMBEDDED COMMUNICATIONS COMPUTING (ECC)
JK MICROSYSTEMS
KONTRON AG
MEASUREMENT COMPUTING CORPORATION
RTD EMBEDDED TECHNOLOGIES, INC.
SBS TECHNOLOGIES
VersaLogic Corporation
WINSYSTEMS, INC.

Platinum status is awarded on the basis of an online survey of merchant computer board purchasers and specifiers, who are asked to identify vendors with whom they are familiar and then to rate each on several non-product selection criteria. This provides an indication of customer satisfaction. Congratulations to all of our winners for a job well done!

ABOUT THE STUDY

VDC's **MERCHANT COMPUTER BOARDS FOR EMBEDDED/REAL-TIME APPLICATIONS INTELLIGENCE PROGRAM** comprises five reports:

- Volume I: Slot Single Board Computers and Embedded CPU Blades
- Volume II: Embedded Motherboards
- Volume III: Mezzanine Cards and Computers-on-Modules (COMs)
- Volume IV: Stackables (PC/104 Family, EBX, etc.)
- Volume V: Global Embedded Merchant Board Market Overview and Outlook

This market intelligence program will provide accurate, conservative, detailed assessments –including market estimates, forecasts, share analysis – of the enterprise mobility market opportunities and requirements worldwide.

ABOUT VDC

Venture Development Corporation (VDC) is an independent technology market research and strategy consulting firm that specializes in a number of embedded, industrial, defense and niche enterprise IT markets. VDC has been operating since 1971, when the firm was founded by graduates of the Harvard Business School and Massachusetts Institute of Technology. Today, we employ a talented collection of analysts and consultants who offer a rare combination of expertise in the market research process, experience in technology product and program management, and formal training in engineering and marketing. VDC's clients include thousands of the largest and fastest-growing tech suppliers in the world and the most successful investors participating in the markets we cover.

For more information, please contact:

J. Eric Gulliksen, Embedded Hardware Practice Director
ericg@vdc-corp.com
508-653-9000, Extension 149

Marc Regberg, Vice President
msr@vdc-corp.com
508-653-9000, Extension 111

VENTURE DEVELOPMENT CORPORATION

One Apple Hill Drive ♦ Box 8190, Ste. 206 ♦ Natick, MA 01760-9904

T: 508.653.9000 ♦ F: 508.653.9836 ♦ E: info@vdc-corp.com ♦ W: www.vdc-corp.com

cak – 04/05

