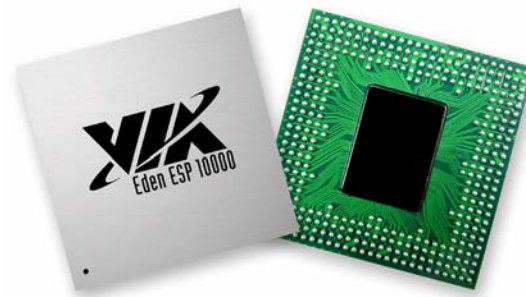




VIA Embedded Platform Roadmap

January 20th 2005 Update



Latest Updates

- Added VIA C7 processors
- Updated Power/Schedule Page
- VIA C7, Eden (V4 bus), CN900 Product Brief available
- Windows CE MPEG-2 SDK for CLE266/CN400 V1.0 Beta
- Windows XP Embedded with Service Pack 2

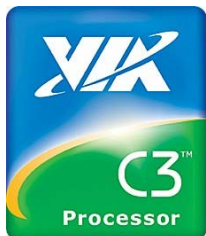
- ***All VIA Embedded Products Available in Lead-free Package. Certification documents available upon request***
- ***VIA's lead-free manufacturing processes comply with:***
 - *RoHS Restriction of Hazardous Substances*
 - *WEEE Waste Electrical and Electronic Equipment*

Embedded Product Positioning



High Performance

- ✓ High speed, high bandwidth, yet low power consumption and heat dissipation
- ✓ Excellent Digital Media Application Performance



Mainstream

- ✓ Balanced solution for feature and value
- ✓ Excellent productivity application performance

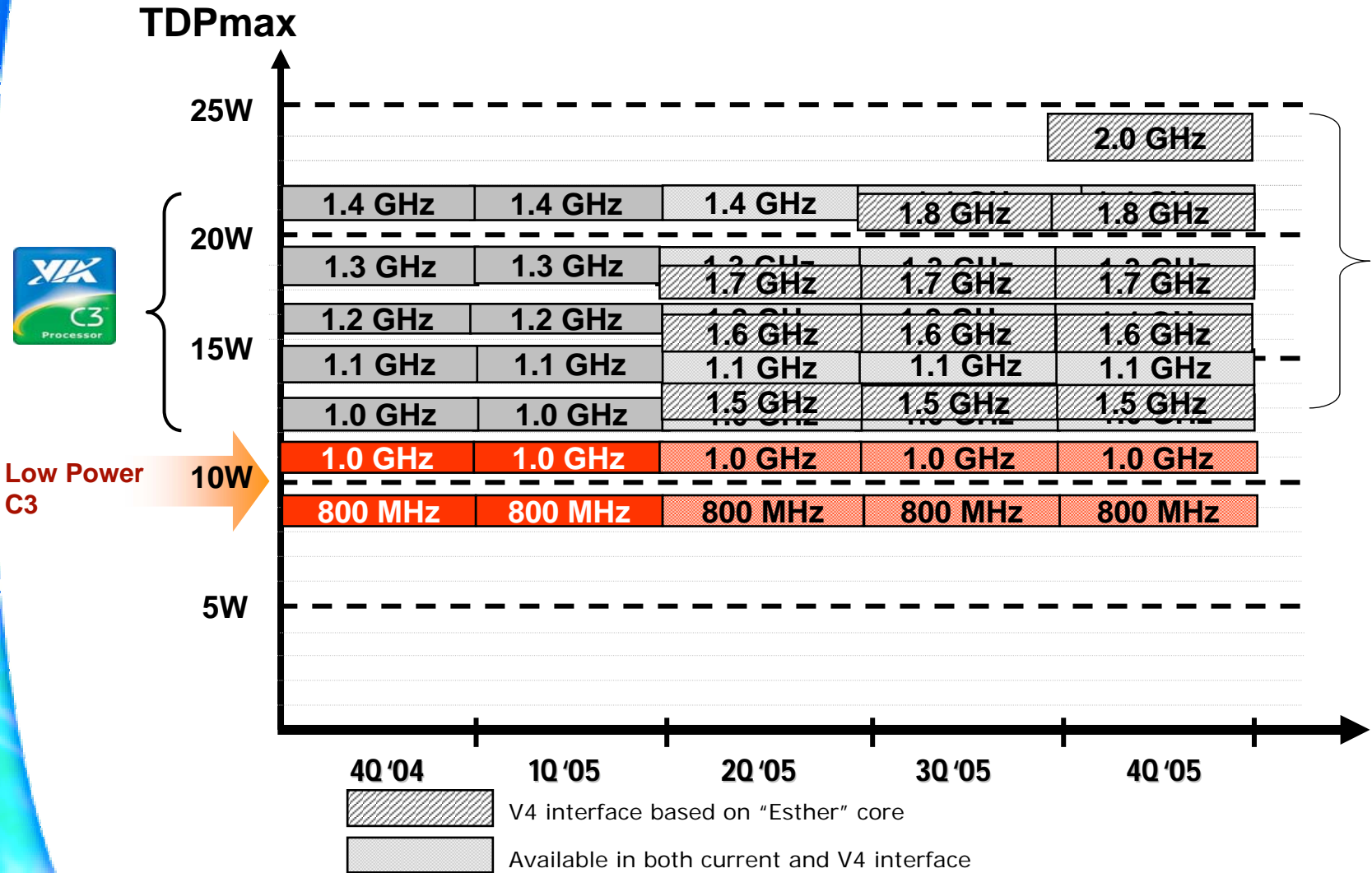


Fanless

- ✓ Low heat and low power consumption
- ✓ Smallest footprint x86 platform
- ✓ High integration and scalability

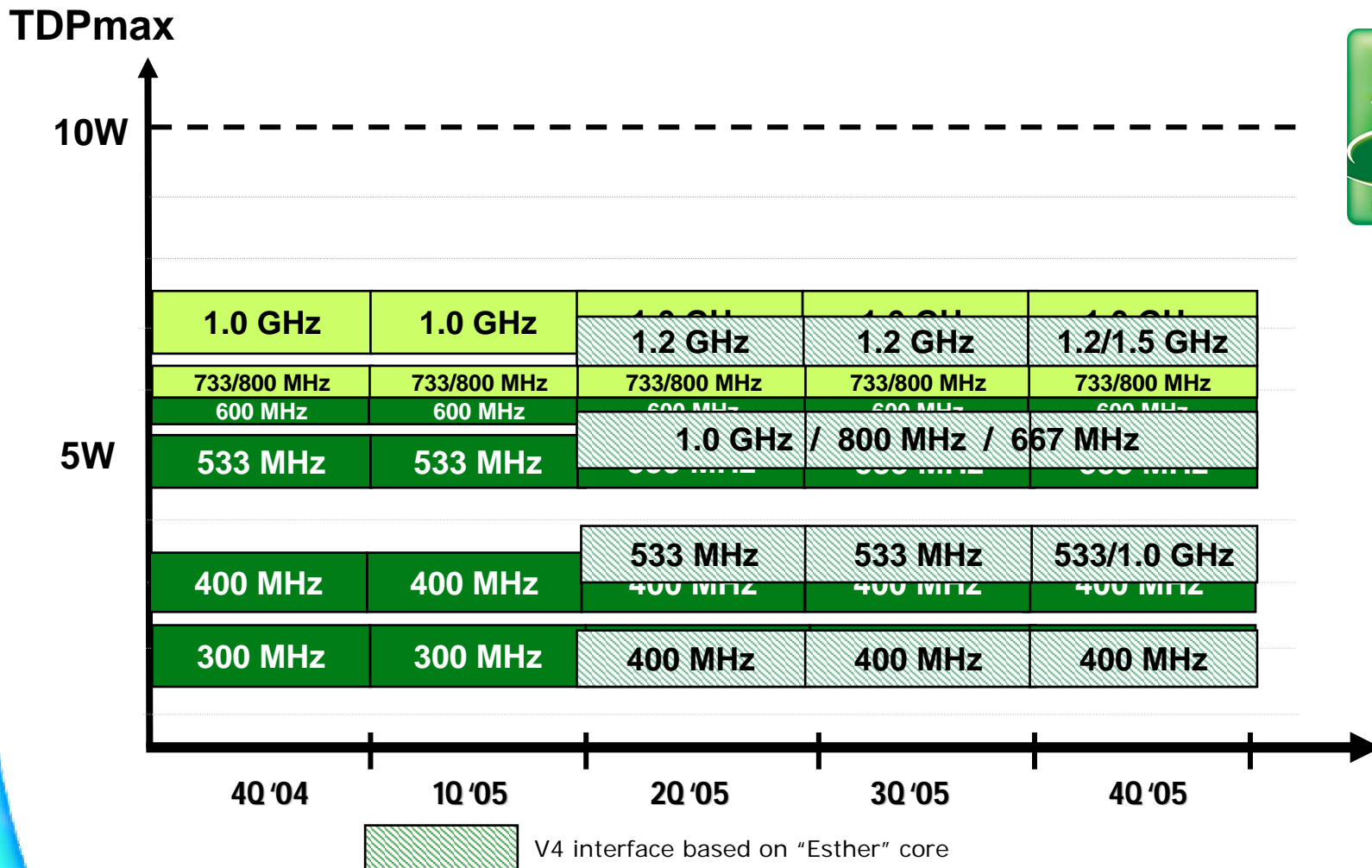


VIA C3/C7 Power & Schedules



- C3 800MHz not included
- C7 power consumption are preliminary estimations

VIA Eden Power & Schedules



- Power Consumption for Eden processors with V4 bus are preliminary estimations
- Eden Processor power numbers are the absolute maximum power consumption

V4 Platform

- **New “V4” bus interface at 400/533MHz, future plans up to 800MHz**
 - 32-bit addressing, 64-bit data
 - Less pin count, lower power consumption
 - 50% better write bandwidth
 - Linear ordering modes for better read-latency
- **Based on “Esther” core with IBM 90nm SOI process technology**
- **Proprietary flip-chip BGA Package**
- **C7 up to 2.0GHz, Eden up to 1.5GHz**
- **L1/L2 cache = 128/128KB** (*128/64KB for C3*)
- **SSE3/SSE2 / MMX** (*SSE/MMX for C3*)
- **JTAG port enabled**
- **Built-in hardware RNG, AES Encryption, RSA, SHA-1**
(RNG and AES only for C3)
- **“NX” bit for virus protection**

VIA Processor Core Roadmap

90nm SOI

0.13u

0.15u

Samuel 2 (C5B)
 133FSB
 L1/L2 = 128/64KB
 MMX/3DNOW!

Nehemiah (C5P)
 L1/L2 = 128/64KB
 SSE / MMX
 Full speed FPU
 APIC support
 RNG&ACE unit

Esther (C5J)
 V4 bus 400/533MHz
 Future Plan for 800MHz FSB
 L1/L2 = 128/128KB
 SSE3/SSE2 / MMX
 More Security Features
 JTAG Support
 "NX" bit for virus protection
Late June Production

Ruth (C5Q)
 V4 bus 400/533MHz
 SSE/MMX, APIC support
 RNG&ACE unit
 "NX" bit for virus protection
Late June Production

Isaiah (CN)
 64-bit
 90nm Process
 Out of order exe.
 Super scalar

Product Lines Supported



800MHz
 300-600MHz



1.0GHz-1.4GHz
 733MHz-1.0GHz



1.5GHz-2.0GHz
 1.0GHz-1.4GHz
 400MHz-1.5GHz



VIA Embedded Platform
www.viaembeddedplatform.com

Product Differentiation – C3/C7

	C3 Processor			C7 Processor
	Regular	Low Power	V4	V4
Speed Offerings	1.0 - 1.4GHz	800MHz / 1.0GHz	800MHz - 1.4GHz	1.5 - 2.0GHz
TDP max	13 - 21W *	9 / 11W	9 - 21W	12 - 25W Max **
Package	CPGA & EBGA	EBGA	Flip chip BGA	Flip chip BGA
Vcore	800MHz: 1.65V 1.0GHz+: 1.4/1.45V	1.25V	TBD	TBD
L1/L2	128 / 64KByte	128 / 64KByte	128 / 64KByte	128 / 128KByte
Case Temperature	CPGA: 70C EBGA: 85C	85C	100C	100C
Dimension (mm)	CPGA: 50x50x6.13 EBGA: 35x35x1.57	35x35x1.57	TBD	TBD
Power Saving Technology	PowerSaver 1.0 (Frequency Change)	PowerSaver 1.0 (Frequency Change)	TBD	TBD

* C3 EBGA parts TDP max not 100% tested and guaranteed. Eden TDPmax are absolute maximum power numbers

** C7 TDP max not 100% tested and guaranteed

Product Differentiation – Eden

	Eden			Eden-N
	Regular	V4	V4 Ultra Low Voltage	Regular
Speed Offerings	300MHz - 1.0GHz	400MHz - 1.2GHz	1.0GHz / 1.5GHz	533/800/1.0GHz
TDP max	3 - 7 W	2.5 - 7 W	3.5W @ 1.0GHz 7W @ 1.5GHz	3 / 5 / 7 W
Package	EBGA	Flip chip BGA	Flip chip BGA	nanoBGA
Vcore	1.05 V 1.2 V (533&667MHz)	TBD	TBD	1.05 V
L1/L2	128 / 64KByte	128 / 128KByte	128 / 128KByte	128 / 64KByte
Case Temperature	85C 100C By Request	100C	100C	85C
Dimension (mm)	35x35x1.57	TBD	TBD	15x15x1.85
Power Saving Technology	Power Saver 1.0 (Frequency Change)	TBD	TBD	PowerSaver 3.0 for 1.0GHz part

VIA Embedded Chipset Solutions

Northbridge for C3/Eden

CN400/CN333

- FSB @100/133/**200MHz(CN400 only)**
- DDR266/333/400(CN400 only)
- Int. UniChrome™Pro GFX
- **Display Resolution:**
1920 x 1440 @75 Hz
- Int. UniChrome™Pro Graphics
- **2D/3D/Video H/W Rotation**
(CN400 only)
- **AGP 4X/8X port(CN400 only)**
- Full MPEG2/MPEG4 decoder(CN400 only)
- Int. video processor
- Ultra V-Link
- TDP@ 2.5W
- Production Now



Northbridge for V4 Bus

CN900

- V4 FSB 400/533 MHz
- DDR 333/400, **DDR2 400/533**
- Int. UniChrome™Pro graphics
- Int. MPEG-2 decoder
- **AGP 3.0 8X Interface**
- DuoView™, CRT, DVO ports
- 8X V-Link
- Sample: Q1'05
- Production: Q2'05

All-In-One for V4 bus

CX700M

- V4 FSB 400/533 MHz
- DDR333, DDR2 400/533
- Int. 128-bit UniChrome™ Pro 2D/3D graphics
- **MPEG2/MPEG4 Decoder**
- **WMV9 Decoder**
- DuoView™, CRT, DVO ports
- **Integrated HDTV encoder**
- Integrated LVDS/DVI transmitter
- Intensive Power Management
- **6 USB 2.0 ports**
- HD Audio, LPC, ACPI 2.0
- Sample: May '05, 'Production: July '05

CX700

- V4 FSB 400/533 MHz
- DDR333, DDR2 400/533
- **32/64b DRAM Data Width**
- **ECC support**
- Int. 128-bit UniChrome™ Pro 2D/3D graphics
- Up to 2 MPEG2 HD streams, PiP support
- DuoView™, CRT, DVO ports
- Integrated LVDS/DVI transmitter
- Intensive Power Management
- **6 USB 2.0 ports**
- HD Audio, LPC, ACPI 2.0
- Sample: May '05, 'Production: July '05

VT8237R



- **2 ports SATA**
- Ultra V-Link
- Total 6 HDD support
- RAID 0, 1, 0+1 support
- 8 ports USB 2.0
- VIA MAC with MII Interface
- 10/100 BT w/ Ext. PHY
- 6 ch. AC'97 audio, Int.
- IO/APIC

VT8251

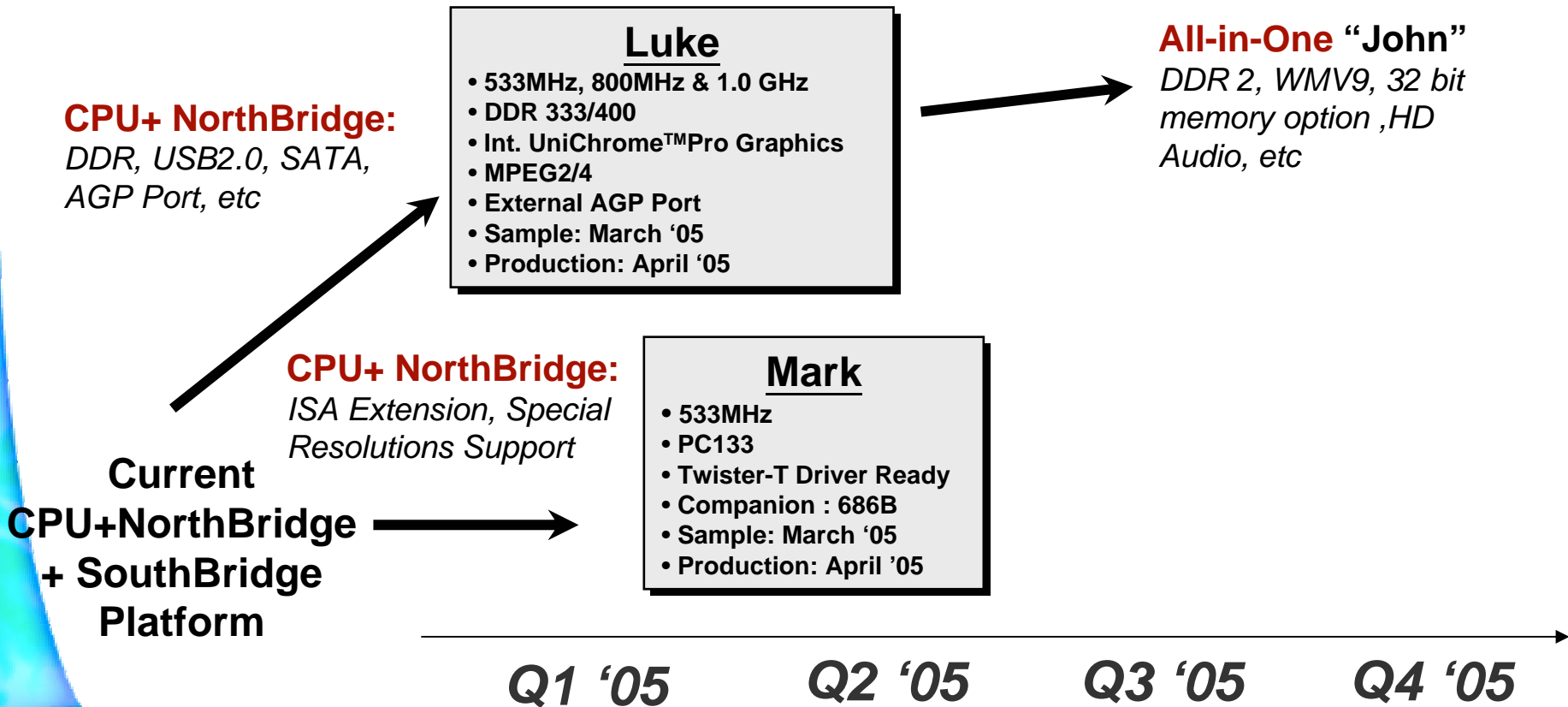


- **2x1 Lane PCI-Express**
- Ultra V-Link
- Total 8 HDD support
- SATA Advanced Host Controller Interface (AHCI)
- RAID 0, 1, 0+1
- JBOD support
- VIA 10/100MAC
- **High Definition Audio™**
192k/32bit 8CH
- AC97 96K/20-bit 6 channel HSP V.92
- ACPI 2.0
- Production: Q2'05



CoreFusion™ Roadmap

The VIA "CoreFusion™" technology provides highest level of integration and miniaturization. Leveraging proven technologies and infrastructure, developers can introduce small form factor designs with the fastest time-to-market



VIA Processor Security Roadmap



Faster, More Secure, Direct Access, and Built-in!

Complete Set of security primitives in the processor:

- Hardware provides increased security & performance. Processor (vs. other chips) is faster & more secure
- Primitive “building-block” functions, including Hardware Random Number Generator, Encryption (Symmetric & Public Key acceleration) and Secure Hash
- “Esther” provided execution protection (NX) for countering email worms/viruses (This new feature is included in the Microsoft Windows XP Service Pack 2)
- For more information, please refer to the VIA Packlock™ web page http://www.via.com.tw/en/padlock/padlock_initiative.jsp

Hardware RNG*

2 Hardware RNG units

4 selectable quality levels vs. rates



Encryption

RSA Hardware Assist**

Montgomery multiply

New Modes for AES in “Esther”

+CBC/CFB-MAC modes

+CTR mode

Full AES (FIPS*-197) standard in hardware**

(encrypt & decrypt, 128, 192, 256b keys)

ECB,CBC,CFB,OFB hdw modes

Secure Hash

Full SHA-1 & -256 (FIPS-180-1) Standard in Hardware

* “RNG” means “Random Number Generator”

** “RSA” is the most widely used public-key cryptography system for Internet encryption and authentication

*** “FIPS” means “Federal Information Processing Standards”

Security features on current C3 is only for 1.0GHz and above, Eden 733MHz and above

VIA Embedded Peripheral Solutions

VIA Embedded Product Longevity Program and Lead-free Options apply to all the following products

Audio

VT1612A/VT1616/1617A

- AC'97 Codec
- 2 or 6 ch. Outputs
- Headphone Amp
- S/PDIF Output
- Built-in HP Amp/PLL (VT1617A)

Video

VT1622A/VT1623/VT1625

- HDTV Encoder (VT1625)
- NTSC / PAL system
- CVBS, S-Video, Component, SCART
- Up to 1024x768
- Macrovision

Super I/O

VT1211

- Super I/O
- Hardware Monitoring
- EEPROM Interface

SATA

VT6421L

- Serial ATA RAID Controller
- 2 SATA Ports Support up to 4 SATA Devices
- 1 PATA Channel Supports up to 2 IDE Devices
- RAID 0, 1, 0+1 Support

1394

VT6306/VT6307

- 1394OHCI with 3- port PHY (VT6306)
- 1394OHCI with 2 port PHY (VT6307)

LAN

VT6103/VT6106H/VT6122

- 10/100 PHY (VT6103)
- 10/100 Single Chip (VT6106H)
- Gigabit Single Chip (VT6122)

USB 2.0

VT6212L

- USB2.0 PCI 4-port Host Controller

LVDS

VT1631L/1634AL (Transmitter)

- 25~85MHz
- Dual Channel Tx (VT1631)
- Single Channel Tx (VT1634)
- VGA to UXGA / XGA, up to 4.76Gbps

Product Life Cycle Guaranteed

- The VIA Embedded product line has been tailored to meet specific life cycle needs of the embedded market, typically 4 years from product release.
- **Longer product life cycle support upon request**
- **New C7 product life cycle time frames will be released upon product launch**

■ Processor	<i>Until</i>
■ C3 LP 800/10K	Dec/2007
■ Eden-N 5000-10K	Dec/2007
■ ESP7000-10K	Dec/2007
■ ESP3000-6000	Dec/2006

■ North Bridge	<i>Until</i>	South Bridge	<i>Until</i>
■ CN400	Dec/2008	VT8237R	Dec/2008
■ CN333	Dec/2008	VT8235M(CD)	Dec/2007
■ CLE266	Dec/2007	VT8231	Dec/2007
■ Twister-T	Dec/2007	VT686B	Dec/2007
■ PLE133	Dec/2007		
■ Pro266T	Dec/2007		



Microsoft Windows XP, XP Embedded /WinCE Support

Microsoft Windows CE Certified:

<http://msdn.microsoft.com/embedded/usewinemb/ce/supproc/default.aspx#x86>

•Board Support Packages

Twister/ProSavage based BSP, CN400 based BSP.

All VIA BSPs for Windows CE 5.0

•Display Drivers for Windows CE .NET 4.1/4.2/5.0

CLE266, CN400 DirectDraw-Direct3D display driver

PLE133, PN133T DirectDraw display driver

•Audio Drivers for Windows CE .NET 4.1/4.2/5.0

•ATAPI PCI/IDE Storage Block Driver for Windows CE .NET 4.1/4.2/5.0

•Network Drivers for Windows CE .NET 4.1/4.2/5.0

•Other Drivers & Utilities for Windows CE .NET 4.1/4.2/5.0

C3 CPU Power Saver (prev. Long-Haul) utility

C3 Nehemiah CPU hardware random number generator driver

Persistent registry management with HDD & Disk-On-Chip & floppy disk

SCI power management; VIA C5P CSP

•System Test Kit for Windows CE .NET 4.2/4.1/5.0

GDI application test tool ; Frame buffer read/write speed test tool;

Audio wave recorder-player; Audio mixer utility;

Storage read/write speed test tool ; C3 CPU speed monitor ; VIA CE Player;

C3 Nehemiah CPU hardware random number generator test suite



Linux Support



- Publicly available open source drivers
 - VIA application notes for download
 - VIA binary drivers for download or by request
 - VIA "shared" source code for download or by request
 - Other source code released on a needed basis
 - Special Projects in SourceForge.net
 - **NEW!** Media SDK 3.5 for CLE266/CN400
- **Linux Distribution**
 - Red Hat 9, Fedora core 1/Fedora core 1 (x86_64), Fedora core 2/Fedora core 2 (x86_64), Mandrake 9.2/10.0,
 - Available Soon – Fedora Core 3 and Mandrake 10.1 **NEW!**
 - **By request:** MontaVista, SuSE, Red Flag, Debian, Slackware, etc.

Technical Documents Available

- VIA C7, Eden(V4) Product Brief (New)
- VIA CN900 Chipset Product Brief (New)
- VIA Chipset/Processor Datasheets
- VIA Chipset/Processor BIOS Writer Guides
- VIA Processor Application Notes
- VIA Processor EPGA Motherboard Design Guide
- VIA Processor Thermal Design Guide
- Packaging specifications for EPGA
- VIA Processor Tested Applications
- VIA Processor Tested Operating Systems
- VIA Platform Benchmark Reports