

# Technical Specifications

## Processor

Model	Processor	Clock speeds
Satellite 230CX	Intel Pentium with MMX™-technology (2.5-volt core using 'Voltage Reduction Technology')	133 MHz internally 66 MHz externally (Switchable speeds for power saving)
Cache memory	32 KB on CPU chip	64-bit

## System memory

Memory type	Amount	Access speed	Data bus width
EDO RAM	16 MB	60 nanoseconds	64-bit
Maximum memory expansion (EDO RAM)	144 MB	60 nanoseconds	64-bit
BIOS Flash EPROM	256 KB	150 nanoseconds	8-bit
Video RAM	2 MB	50 nanoseconds	16-bit
Level 2 cache	256 KB	14 nanoseconds	8-bit

## Memory technology

Technology	3.3-volt
No. of memory expansion slots	1
Expansion module sizes	8, 16, 32, 48 and 128 MB

## Memory map

Address	Size (KB)	Usage
00000000-0009FFFF	640	System working memory
000A0000-000BFFFF	128	Video RAM area
000E0000-000EFFFF	64	Video BIOS RAM (default)
000E0000-000EFFFF	64	Video BIOS (RAM shadow)
000F0000-000FFFFF	64	System BIOS (RAM shadow)
00100000	rest of memory up to 144 MB maximum	System extended memory
FFFE0000-FFFEFFFF	64	SM-RAM in SM mode
FFFF0000-FFFFFFF	64	System BIOS ROM

## Diskette drive

Specification	High setting	Low setting
Media supported	3.5 inch 2HD	3.5 inch 2DD
Storage capacity	1.44 MB	720 KB
Rotation	300 rpm	300 rpm
Transfer rate	500 kbit per second	250 kbit per second
Bytes per sector	512	512
Sectors per track	18	9
Dimensions	126 x 96 x 12.7 mm	

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### Hard disk drive

<b>Formatted capacity</b>	1.44 billion bytes (1.34 GB)
<b>Max. data transfer to media</b>	38.6 – 69.8 Mb/s/sec
<b>Average seek time</b>	13 ms (typical)
<b>Track-to-track seek time</b>	3 ms (typical)
<b>Drive rotation</b>	4,200 rpm
<b>No. of disks</b>	2
<b>No. of read/write heads</b>	6
<b>Coding</b>	8-9 RLL
<b>Bytes per sector</b>	512
<b>Interleave</b>	1:1
<b>Interface</b>	ATAPI (Enhanced IDE)

### Optional CD-ROM (Swappable with floppy disk drive)

<b>Supported CD-ROMs</b>	12 cm/8 cm
<b>Applicable disc format</b>	Red-Book, Yellow-Book, CD-ROM XA, CD-Bridge, (Photo-CD, Video-CD) CD-I, CD-I Ready, CD-G, Multisession (Photo-CD, CD-Plus)
<b>Rotation speed (rpm)</b>	800 to 2120 (4X)      2200 to 3500 (10X)
<b>Sustained data transfer rates (typical)</b>	
<b>Yellow-book mode 1</b>	600 KB/s (4X)      1500 KB/s (10X)
<b>Yellow-book mode 2</b>	684 KB/s (4X)      1710 KB/s (10X)
<b>Burst (Atapi interf. PIO mode)</b>	11.1 MB/s (3)
<b>Average random access</b>	200 ms (4X)      180 ms (10X)
<b>Average full stroke access</b>	340 ms (4X)      320 ms (10X)
<b>Dimension</b>	128 x 12.7 x 129 mm      5.0 x 0.5 x 5.0 inches

### Screen

<b>Screen type</b>	Advanced DSTN
<b>Number of dots</b>	800 x 600
<b>Dot pitch</b>	0.3075 x 0.3075 mm
<b>Display area</b>	245.98 x 184.48 mm
<b>Diagonal</b>	12.1 inch
<b>Contrast ratio</b>	40:1 (typically)
<b>Colour palette</b>	64 K
<b>Response rise/fall</b>	100 ms / 50 ms
<b>LCD brightness (AC operated)</b>	80 NIT
<b>LCD brightness (battery op.)</b>	50 NIT

\* Maximum colours with dithering. Video modes with more colours use optimised colour adaption.

Video modes	Video display	Resolution	Max. refresh rate	Max. number of colours
	Internal display	640 x 480	85 Hz	16 colours
	VGA			
	Internal display SVGA	640 x 480	85 Hz	up to 64 K colours
	Internal display SVGA	800 x 600	85 Hz	up to 64 K colours
	Dual display VGA	640 x 480	60 Hz	16 colours
	Dual display SVGA	640 x 480	60 Hz	up to 16.7 million colours
	Dual display SVGA	800 x 600	60 Hz	up to 16.7 million colours
	Dual display SVGA*	1024 x 768	60 Hz	up to 64 K colours
	Dual display SVGA*	1280 x 1024	60 Hz	up to 256 colours
	External display	640 x 480	85 Hz	up to 64 K colours
	SVGA			
	External display SVGA	800 x 600	85 Hz	up to 64 K colours
	External display SVGA	1024 x 768	85 Hz	up to 256 colours
	External display SVGA	1280 x 1024	85 Hz	up to 256 colours
* More pixels required than are available. Picture will scroll.				
Physical dimensions	Weight		3.1 kg* (8 lbs)	
	Size (W x L x H)		303.6 x 239 x 50.5 mm	
	Size (inches)		(11.9" x 9.4" x 1.9")	
	*Including FDD, cables & battery.			
Battery types	Main	Back-up	RTC	
	Lithium-ion	NiH <sub>2</sub>	NiH <sub>2</sub>	
	3.6 V x 1200 mAh	7.2 V x 110 mAh	3.6 V x 30 mAh	
Resume battery back-up	Main		5 days (typical)	
	Back-up		4 hours (typical)	
	RTC		1 month (typical)	
Battery life	Maximum life		2.5 Hours: PC Magazine's Rundown V2.0	
			Battery life doubles with 2 <sup>nd</sup> battery	

<b>AC adaptor</b>	<b>Input voltage</b>	100 - 240 V AC, self-adjusting
	<b>Frequency</b>	50 - 60 Hz
	<b>Output voltage</b>	15 V
	<b>Output current</b>	3 A max.
	<b>Power dissipation</b>	45 W max.
	<b>Weight</b>	340 g

<b>Connectivity &amp; expansion</b>	<b>PC ports</b>	<b>Card Station III</b>	<b>Expansion</b>
	Serial	Serial	PC: 1 PC Card slot for 2 Type II cards or 1 Type III card CardBus and ZV port ready
	Parallel (ECP)	Parallel (ECP)	PC: Internal memory module slot
	(S)VGA monitor	(S)VGA monitor	Card Station: 2 Type III PC Card slots
	External FDD	External FDD	
	Card Station connector	Notebook connector	
	Serial infrared port	MIDI/Joystick connector	
	USB	2x USB	
	PS/2 keyboard/mouse	PS/2 keyboard/mouse	
	Audio in	Audio in/out	
	Headphone	Headphone	
	External microphone	Kensington Cable Lock (PC Card slot security integrated)	
	Select Bay for FDD/CD-ROM/2 <sup>nd</sup> Battery/2 <sup>nd</sup> HDD		

<b>Sound system</b>	16-bit, SoundBlaster Pro compatible & Windows Sound System V.2.0
	MIDI and Wave support
	Built-in microphone and 2 stereo speakers
	Internal microphone which is disabled when an external speaker is connected

<b>Bundled software</b>	PCs with Microsoft Windows®95:
	• Toshiba utilities and drivers for Windows® 95
	• Hypertext on-line help (User's Manual)
	• Puma Intellisync '97
	Other Microsoft operating systems on request

**Environmental conditions**

	<b>Operating</b>	<b>Non-operating</b>
Temperature	5° C to 35° C	-20° C to 65° C
Max. thermal gradient	20° C/hour	20° C/ hour
Relative humidity	20% to 80% non-condensing	10% to 90% non-condensing
Altitude (relative to sea level)*	-60 to 3,000 m (-200 to 10,000 feet)	-60 to 10,000 m (-200 to 30,000 feet)
Shock**	10 G	60 G
Vibration**	0.25 G	1 G

\* Aeroplane cabin pressures simulate low altitudes, so flying higher causes no restrictions.

\*\* When CD-ROM drive installed.

**Certification**

This product is approved for electrical safety and/or electromagnetic compatibility (EMC) by the following associations:

TÜV

FIMKO

DIN GOST TÜV

SEV

UL

CSA

FCC

SASO

SAA

The manufacturer declares that this product complies with the following directives and regulations for the CE-marking. The party responsible for CE approval is Toshiba Europe GmbH.

93/68/EEC CE marking directive

89/336/EEC EMC directive

73/23/EEC Low voltage directive

91/263/EEC Telecommunication Directive

EN 60950 Electrical safety

EN 55022 B EMC/Radio disturbances

EN 50082-1 EMC Immunity

EN 61000-3-2, -3-3 Disturbances in supply systems



# Features & Benefits

## Processor

Feature	Benefit
Intel Pentium®, 133 MHz	Provides high speed, true 64-bit processing power to cope with even the most advanced software applications and GUI's
MMX™- technology	Improves the overall performance speed especially multimedia applications
2.5-volt core technology	Reduces the amount of power consumed (longer battery operating) and reduces heat generated
32 KB cache on chip	Speeds up processing of data between CPU and memory
Integrated numeric co-processor	Faster processing of maths-intensive applications

## Memory

Feature	Benefit
Standard 16 MB EDO RAM	16 MB is the ideal amount of RAM for Windows to run powerful, memory intensive software and operating software at a comfortable speed
Expandable up to 144 MB	Enough expansion room for the most demanding user
Level 2 cache 256 KB	Ensures optimal memory access speed, allowing highest possible performance
8 MB, 16 MB, 32 MB, 48 MB, or 128 MB memory modules (optional)	Faster manipulation of software and data stored in memory
Shadow ROM	User can upgrade memory when need arises
256 KB Flash EPROM	Enhances computer performance
	Flash EPROM's allow user to quickly update BIOS if necessary via software without returning machine to supplier

## Removable internal FDD drive

Feature	Benefit
3.5" diskette drive	Provides small, durable, industry-standard media for portable environment
	Easily removed to make way for the CD-ROM
	Reads from and writes to 3.5" 720 KB and 1.44 MB diskettes

## Removable hard disk drives

Feature	Benefit
1.44 billion byte removable hard disk	Provides large storage capacity for multiple programs and data
= 13 ms average access time and 1:1 interleave	Fast access to programs and data stored on hard disk
Low-power consumption modes	Maximise battery operating life

## Satellite 230CX - Features and Benefits

<b>Optional CD-ROM drive</b>	<b>Feature</b>	<b>Benefit</b>
	12 mm high ten-speed CD-ROM drive	Ideal for video and sound files Reads from 8 cm and 12 cm CD-ROMs
<b>SelectBay</b>	<b>Feature</b>	<b>Benefit</b>
	SelectBay	Store up to 640 MB on one disk Store an additional HDD or battery here to enlarge the data carrying capacity or increase battery life

<b>Display</b>	<b>Feature</b>	<b>Benefit</b>
	Advanced DSTN screens	Most modern colour flat screen technologies available
	Advanced DSTN display	Higher contrast, with less crosstalk Replacing conventional DSTN
	30.7 cm (12.1")	Faster response time than a conventional DSTN Comfortable working size Perfect for presentation graphics and all Windows-based applications

<b>Graphics sub-system</b>	<b>Feature</b>	<b>Benefit</b>
	Advanced video controller with SVGA resolutions	Practical for presentations on large monitors or data projectors or for work with design or DTP programs in the office or on the road
	Graphics adaptor	64 K colours at 800 x 600 (int.) and 16.7 mill colours at 800 x 600 (ext.)
	PCI local-bus	Speeds up the transfer of data to screen creating faster images and clearer video
	Video graphics accelerator	Ensures that graphics are generated quickly on screens to take advantage of Graphical User Interfaces such as Windows
	Dual display mode	Allows user to show data and presentations to colleagues or customers while controlling the procedure from internal screen and keyboard

<b>Keyboard</b>	<b>Feature</b>	<b>Benefit</b>
	Full-function keyboard	3 mm travel ensures faster, more comfortable data entry
	Cursor keys	Allow fast, convenient cursor positioning
	12 function keys and embedded keypad	Provide desktop keyboard functionality and greater productivity
	8 hot keys	Allow users to change set-up features and HotLock security direct from the keyboard
	Palm-rest for hands	Allows easy comfortable typing, even where there is no flat surface



**Pointing device**

<b>Feature</b>	<b>Benefit</b>
Integrated MousePoint pointing device with buttons built into panel	Easy to use  Precise control of cursor  No protruding extras when travelling

**Interfaces**

<b>Feature</b>	<b>Benefit</b>
SVGA colour monitor port	Provides high-resolution (up to 1280 x 1024 dots) display of colour and graphics on external monitor
Parallel (ECP) port	Allows use of peripheral devices accepting parallel signals  Permits easy data exchange with external storage devices  Permits easy and rapid data exchange with external devices, (e.g. CD-ROMs and networks)
Fast infrared port	Wireless bi-directional transmission of files between many types of devices incl. PCs, printers, PDAs, modems, telephones.  Low power consumption  IrDA 1.1 compliant-industry standard
PS/2 keyboard/mouse port	Provides full keyboard versatility  Allows use of 102-key keyboard when desired; increases productivity of operators familiar with 102-key keyboard  Allows faster, more accurate entry of numerical data  Allows use of desktop pointing devices such as a mouse with graphics and presentation software  Frees serial port for use by another device  Increased productivity of operators familiar with using a mouse
Audio in	Lets you play stereo sound from an external device
Microphone	Enables connection of a microphone for audio input
Headphone	Enables connection of a stereo headphone for audio output
Card Station III connector	Provides an instant connection to all devices hooked up to base
External FDD	Allows connection and use of a floppy and CD-ROM simultaneously
MIDI/Joystick connector (via Card Station)	Connect a MIDI device such as a synthesiser to compose music or connect a joystick for games
Universal Serial Bus	Allows to hook up to 127 peripheral devices to run simultaneously on the PC
Audio out (via Card Station)	Lets you out put stereo sound to an external device

## Expansion slots

Feature	Benefit
2 Type II or 1 Type III PC card slot	Provides mobile communication and expansion in a credit-card-sized format
CardBus and ZV Card ready	Allows access to many, high performance PC Card expansion devices
	Can be used for a wide range of communication and expansion modules such as modems, network adaptors, flash memory cards and removable hard disks
	Enhances high-end multimedia capability to the computer

## Design

Feature	Benefit
A4 notebook design	Provides the speed, power and expandability of a high performance desktop in a lightweight, go-anywhere form
Rugged ABS casing	Tough enough to take the knocks of life on the road
	Colour is integrated into material so casing doesn't require painting and there is no danger of paint peeling or scratching

## Power system

Feature	Benefit
Lightweight removable, rechargeable lithium-ion battery packs	Higher capacity than other battery types
	Environmentally friendly to dispose of
	Offers long battery life
Toshiba MaxTime™ Power Management (MTPM)	Allows user to specify when power-hungry components should be shut down to make most efficient use of available battery power
Advanced Power Management (APM)	Determines power needs by communicating with APM compatible software and passing on information to MTPM
Intelligent power supply with battery "gas gauge," invoked through pop-up menu	Provides easy access for monitoring battery life
System reset button	Allows rebooting without cycling power and without keyboard use (functions even when keyboard is locked)

## Multiple security system

Feature	Benefit
System password security	Stops unauthorised access to data and software when power is switched on
HotLock security	Instant security with a screen blank and keyboard/mouse lock-out using the F1 hot key
Kensington MicroSaver provision	Hardware-based theft prevention. The computer can be physically secured to an immovable object

## Special features

Feature	Benefit
Flash EPROM	Allows end user to easily update BIOS if needed
Built-in sound system	Provides audio support to visuals  16-bit Sound Blaster Pro compatible sound card  Microphone & Speaker inside the computer
Plug & Play BIOS	Ready for Windows®95
AutoResume with AutoSave	Allows you to turn the notebook off without exiting from software application; powers-up where you left off. AutoSave provides security against possible data loss due to loss of power
Pop-up menu	Lets you change the configuration options and monitor the battery power level
Hot keys	Allow users to change various system configuration options any time, at the press of a key
LED icon bar	Users can see the status of the machine even with lid closed
Power button flap	Avoids the risk of accidentally turning the PC on or off

## Toshiba support

Feature	Benefit
1-year International Warranty	Provides confidence that the notebook will give lasting, reliable performance throughout the world

## Options

Feature	Benefit
8, 16, 32, 48 and 128 MB memory modules	Permits convenient, easy-to-install memory expansion for memory-intensive software applications
High-speed PC Card modem	Provides easy access to information world-wide
Extra battery pack	Increases battery life while on the road
Quick battery charger	One battery can be charged using the quick battery charger while the other is in use to extend overall operating time
Key caps for European languages	Users in virtually all countries work with most familiar set of keys
Card Station III	<p>Connects to the back of the series, providing Windows®95 Plug-and -Play connectivity</p> <p>Locks into place with special hooks: very stable</p> <p>Allows customers to leave everything connected in the office, ready for reconnection in one easy clip-on movement</p> <p>Includes a complete row of port options: USB x 2, PS/2 mouse, PS/2 keyboard, RGB, serial, parallel, external FDD, audio in/out, external microphone, headphone, Joystick/MIDI</p> <p>Two separate PC Card Type III slots</p> <p>Kensington Cable Lock Port (PC card slot security functionality is integrated)</p>
PC Card Ethernet adaptor	Lets you connect all your computers to one network

# Options

## Memory

PA Number	Article
PA2038U	8 MB memory kit
PA2039U	16 MB memory kit
PA2040U	32 MB memory kit
PA2041U	48 MB memory kit
PA2042U	128 MB memory kit

## Keyboard

PA Number	Article
PA2217GR	Keycaps for German keyboard
PA2217FR	Keycaps for French keyboard
PA2217SC	Keycaps for Scandinavian keyboard
PA2217SL	Keycaps for Swiss keyboard
PA2217IT	Keycaps for Italian keyboard
PA2217SP	Keycaps for Spanish keyboard
PA2217EN	Keycaps for English keyboard

## Power

PA Number	Article
PA2450UE	Universal AC adaptor
PA2478U	Lithium-ion battery pack
PA2488U E	Battery charger

## Expansion

PA Number	Article
PA2717UE	Card Station III
PA2610U	10-speed CD-ROM
PA2451U	Secondary battery pack
PA2609U	2.0 GB secondary HDD kit

## Communications

PA Number	Article
PA2827E	Modem kit
PCE2-10BC	PC Card Ethernet adaptor