Appendix A

Notebook Specification

This appendix provides the technical specification of the A360 notebook:

A.1 System Specification

MICRO PROCESSOR	
CPU Type	Pentium-III / Celeron Processor
Clock Speed and Voltage	• Pentium-III CPU at 933 MHz, 1/1.1GHz • Celeron CPU at 766/800/850/900/950 MHz
External L2 Cache	256 KB (Pentium-III) / 128KB (Celeron)
CPU Package	FC-PGA
SYSTEM LOGIC CHIPSET	
Chipset Type	• VIA Twister - North Bridge • VI82C686A - South Bridge
Thermal controller	Integrated in South Bridge
SYSTEM CLOCK	
System Clock	SMC FDC37869
Package	SSOP
Clock Summary	• CPUCLK = 66/100 /133 MHz • PCICLK = 30/33 MHz • South Bridge / VGA = 14.318 MHz • North Bridge = 48 MHz
Supply Current	Icc Max = 90mA (CPU = 66.6 MHz, PCI = 33 MHz)
MEMORY MODULE	
Package	SDRAM PC100/133 – 32 / 64 / 128 / 256 MB SO-DIMM
Operation Mode	Synchronous Dynamic Mode
Refresh	Auto and Self Refresh
Slow Refresh	4096 refresh cycle / 64ms
Supply Voltage	3.3V
Configuration	• Standard SODIMM DRAM Module – 2 pieces • 640KB Conventional RAM • 128KB BIOS Shadow • 256KB reserved for Power Management usage • 7168KB Extended RAM • Upgradable to max. 512MB using 256 MB SODIMM x 2
Parity Support	No parity bit for all memory

BIOS ROM	
ROM Type	512K x 8 CMOS Flash Memory –28SF040A-90/120 (SST)
ROM Size	4M-bit
Boot Code Sector	Top Sector
Package	PLCC 32-lead
Erase / Program	• 8 second typical chip erase • 3.6 second chip program • 10,000 erase/program cycles minimum
Program Voltage	5V
Supply Current	• Icc Typ. = 20mA (active read) • Icc Typ. = 30mA (active program) • Iccsb Max = 50uA (standby)
VIDEO SUBSYSTEM	
Video Chipset	S3 Savage 4 (Integrated in Twister) with AGP 4 x SMA
Video RAM	16MB SDRAM (Using system memory, SMA) (Twister spec is 2/32 MB)
Bus Interface	32-bit PCI Local Bus
Addressing	Linear Addressing
Simul Scan	Yes
Maximum Resolution at CRT	1280 x 1024 at 32-bit color (16 million colors)
Maximum Color at CRT	32-bit color (16 million colors)
External CRT connector	15-pin D-Sub female
I/O SUBSYSTEM	
I/O Controller Chip	Integrated in South Bridge
Parallel / Printer Port (LPT1)	25-pin D-sub female connector (with EPP/ECP support)
Serial / COM Port (COM1)	• Type: 9-pin D-sub male RS-232 connector • Baud Rate: 300 – 38400 bps (UART 16C550) • Drivers / Receiver: Maxim MAX3243 (SSOP, 28-pin)
KEYBOARD SUBSYSTEM	
Keyboard Controller	Mitsubis hi M38867
Package	QFP 80-Pin
Host Interface	8042-style host interface
Keyboard Scan	Local 16 x 8 keyboard switch matrix
External PS/2 Keyboard	Mini-DIN PS/2 connector

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SOUND SUBSYSTEM	
Audio Chip	Integrated in VT82C686B (PCI audio)
Bus Interface	32-bit PCI Bus
Compatibility	Sound Blaster 16 (Pro) & 3D Surround Sound
Wavetable Function	Software
Connection	Full-Duplex
Volume	Analog H/W Volume
Built-in Speaker	2-way (left and right) mini speakers
Built-in Microphone	Mono
Line-In Jack	1 x line-in jack
Line-Out Jack	1 x line-out jack
Microphone Jack	1 x 3.5p microphone jack
POINTING DEVICE SUBSYSTEM	
Chipset Controller	Mitsubishi M38867
Package	QFP 80-Pin
Touchpad Type	Synaptics TM41PDG351-1 Glide Point
Interface	PS/2
External PS/2 Mouse	Mini-DIN PS/2 connector (share with PS/2 keyboard)
PCMCIA SUBSYSTEM	
Chipset Controller	O2Micro 026933 PCI-cardbus bridge
PCMCIA Slot Configuration	2 Type I or Type II at the same time, or 1 Type III
Bus Type	32-bit PCI CardBus
Compatibility	Register Compatible with Intel 82365SL
POWER MANAGEMENT UNIT (PMU)	
PMU Modes	Video Timeout, Hard Disk Timeout, Suspend to RAM (STR) mode, Suspend to Disk (STD) mode
Others	LCD Cover-Switch STR, ACPI, DMI 2.0, Thermal Control
STATUS LED INDICATORS	
Number of LEDs	5 LEDs
Power Status LED	Green color when powering on Green color blinking when in STR or STD Amber color in Battery Low.
Battery Charge LED	Green color in charging status Lights off when the battery is fully charged or no battery installed
Internet / Mail LED	Green color when a new mail is arriving
HDD LED	Green color when accessing the HDD
FDD LED	Green color when accessing the FDD
Num Lock LED	Green color for Num Lock activate on keyboard
Caps Lock LED	Green color for Caps Lock activate on keyboard
Scroll Lock LED	Green color for Scroll Lock activate on keyboard

HOT-KEY DEFINITION	
Number of hot-keys	8 <Fn> key combinations
LCD/CRT Simul	Fn + F3 (toggle) (LCD/ CRT/ TV/ LCD&CRT)
Display Stretch / Normal	Fn + F5 (toggle)
PC Speaker On / Off (Mute)	Fn + F6 (toggle)
Brightness Up	Fn + F8
Brightness Down	Fn + F9
Save to Disk	Fn + Power Button
Internet Function Key	Internet Button
Mail Function Key	Mail Button

A.2 Display Specification

12.1" SVGA TFT LCD (HANNSTAR)	
LCD Model	HannStar HSD121PS11
LCD Type	12.1" SVGA TFT
Display Area	H246 x V184.5 [mm]
Display Pixels	H800 x V600 pixels
Pixel Pitch	H 0.3075 x V 0.3075
Pixel Arrangement	RGB vertical stripe
Display colors	262144 Colors
Module Size	W275 x H199 x D6.0 MAX [mm]
Weight	Approx. 410g
Contrast Ratio	250:1 (typ.)
Power Supply	3.3 V
Power Consumption	2.6 W
Response Time	50ms (max)
Operating Temperature	0 to 50 degrees Celsius
Storage Temperature	-20 to 60 degrees Celsius
12.1" SVGA TFT LCD (ADI)	
LCD Model	ADI AA121SJ23
LCD Type	12.1" SVGA TFT
Display Area	H246 x V184.5 [mm]
Display Pixels	H800 x V600 pixels
Pixel Pitch	H 0.3075mm x V 0.3075mm
Pixel Arrangement	RGB stripe arrangement
Display colors	260K Colors
Module Size	H275 x V199 x T6.0 MAX [mm]
Weight	Approx. 440g
Contrast Ratio	150:1 (Typ.)
Power Supply	3.3 V
Power Consumption	3.8 W

Response Time	50ms (max)
Operating Temperature	0 to 50 degrees Celsius
Storage Temperature	-20 to 60 degrees Celsius
13.3" XGA TFT LCD (UNIPAC)	
LCD Model	UNIPAC UB133X01
LCD Type	13.3 " XGA TFT
Display Area	H270.3 x V202.8 [mm]
Display Pixels	H1024 x V768 pixels
Pixel Pitch	H 0.264 x V 0.264
Pixel Arrangement	RGB vertical stripe
Display colors	262144 Colors
Module Size	H284 x V214.5 x D5.9 MAX [mm]
Weight	Approx. 500g
Contrast Ratio	200:1 (typ.)
Power Supply	3.3V
Operating Temperature	0 to 50 degrees Celsius
Storage Temperature	-20 to 60 degrees Celsius
14.1" XGA TFT LCD (HANNSTAR)	
LCD Model	HannStar HSD141PX11-A
LCD Type	14.1" XGA TFT
Display Area	H285.7 x V214.3 [mm]
Display Pixels	H1024 x V768 pixels
Pixel Pitch	H 0.279 x V 0.279
Pixel Arrangement	RGB vertical stripe
Display colors	262144 Colors
Module Size	H298.5 x V226.5 x D6.0 MAX [mm]
Weight	Approx. 520g
Contrast Ratio	250:1 (typ.)
Power Supply	3.3V
Response Time	15ms (rising typ.) / 35ms (falling typ.)
Operating Temperature	0 to 50 degrees Celsius
Storage Temperature	-20 to 60 degrees Celsius
14.1" XGA TFT LCD (CPT)	
LCD Model	CPT CLAA141XC01
LCD Type	14.1" XGA TFT
Display Area	H285.696 x V214.272 [mm]
Display Pixels	H1024 x V768 pixels
Pixel Pitch	H0.279 x H0.279 [mm]
Pixel Arrangement	RGB vertical stripe
Display colors	262K Colors
Module Size	298.5(W) x 227.5(H) x 5.8(D) [mm]
Weight	Approx. 550g

Contrast Ratio	200:1 (typ.)
Power Supply	3.3V
Power Consumption	4.7(W)
Response Time	30ms (max)
Operating Temperature	0 to 50 degrees Celsius
Storage Temperature	-20 to 60 degrees Celsius

A.3 Floppy Disk Drive Specification

CITIZEN X1DE-32R	
Drive Manufacturer	CITIZEN X1DE-32R
Floppy Diskette Type	3.5" Double Sided, High Density
Physical Dimension	126 x 96 x 12.7 [mm]
Weight	160g
Capacity	1.44MB / 1.2MB / 720KB High Density (Formatted) 2MB / 1MB (Unformatted)
Transfer Rate	500 / 250 Kbits/sec
Recording Method	MFM / FM
Track to Track Seek Time	3 ms
Seek Settling Time	15 ms
Average Access Time	94 ms
Disk Revolution	300 (1Mb / 2Mb mode) / 360 rpm (1.6Mb Mode)
FDD Indicator	LED on drive and Media Access LED on LED Indicator
MTBF	15,000
Operating Temperature	5 to 50 degrees Celsius
NEC FD-2238T-220	
Drive Manufacturer	NEC FD-2238T-220
Floppy Diskette Type	3.5" Double Sided, High Density
Physical Dimension	126 x 96 x 12.7 [mm]
Weight	157g
Capacity	1.44MB / 1.2MB / 720KB High Density (Formatted) 2MB / 1MB (Unformatted)
Transfer Rate	500 / 250 Kbits/sec
Recording Method	MFM / FM
Track to Track Seek Time	3 ms
Seek Settling Time	15 ms
Average Access Time	94 ms
Disk Revolution	300 (1Mb / 2Mb mode) / 360 rpm (1.6Mb Mode)
FDD Indicator	LED on drive and Media Access LED on LED Indicator
MTBF	30,000
Operating Temperature	5 to 50 degrees Celsius

A.4 CD-ROM Drive Specification

QSI SCR-242 (CAA8)	
Drive Manufacturer	QSI SCR-242
Physical Dimension	128.0 x 129.0 x 12.7 [mm]
Weight	180g or less
Loading	Manual tray loading
Ejection	Manual eject using the eject button Auto eject using the eject command on software
Host Interface	IDE (ATAPI)
Average Access Time	130msec. average (x24-speed)
Full Stroke Access Time	230msec (x24-speed)
Disc Speed	5,400rpm
Data Transfer Rate (burst)	16.7 MByte/s (PIO Mode 4) 16.7 MByte/s (Multi word DMA transfer mode-2) 33.3 MByte/s (Ultra DMA transfer mode-2)
Data Transfer Rate (sustained)	1,500 ~ 3,600KB/sec
Starting Time	5 sec. Max.
Data Buffer Capacity	128 KB
Supply Voltage	+5VDC
MTBF	70,000POH or more
MKE CR-177-DPK	
Drive Manufacturer	MKE CR-177-DPK
Physical Dimension	128.0 x 129.0 x 12.7 [mm]
Weight	180g or less
Loading	Manual tray loading
Ejection	Manual eject using the eject button Auto eject using the eject command on software
Host Interface	IDE (ATAPI)
Average Access Time	130msec. average (x24-speed)
Full Stroke Access Time	230msec (x24-speed)
Disc Speed	5,400rpm
Data Transfer Rate (burst)	16.7 MByte/s (PIO Mode 4) 16.7 MByte/s (Multi word DMA transfer mode-2) 33.3 MByte/s (Ultra DMA transfer mode-2)
Data Transfer Rate (sustained)	1,500 ~ 3,600KB/sec
Starting Time	5 sec. Max.
Data Buffer Capacity	128 KB
Supply Voltage	+5VDC
MTBF	70,000POH or more

A.5 DVD-ROM Drive Specification

MKE SR-8175-CPK	
Drive Manufacturer	MKE SR-8175-CPK
Physical Dimension	128.0 x 12.7 x 126.1 [mm] (W * H * D)
Weight	290g
Loading	Manual tray loading
Ejection	Manual eject using the eject button Auto eject using the eject command on software
Host Interface	IDE (ATAPI)
Average Access Time	150ms (DVD-9)/120ms(DVD-5)/95ms(CD) Typ.
Full Stroke Access Time	340ms (DVD-9)/270ms(DVD-5)/200ms(CD) Typ.
Disc Speed	3,400 rpm(DVD); 5,100 rpm(CD)
Data Transfer Rate (burst)	16.7 MByte/s (PIO Mode 4) 16.7 MByte/s (Multi word DMA transfer mode-2) 33.3 MByte/s (Ultra DMA transfer mode-2)
Data Transfer Rate (sustained)	Max. 11.08Mbyte/s (DVD) ; Max.3,600Kbyte/s(CD)
Starting Time	Typical 4 sec / Max. 10 sec (from stand by to ready)
Data Buffer Capacity	512 KB
Supply Voltage	+5VDC
MTBF	60,000POH or more
QSI SDR-081 (EFAA)	
Drive Manufacturer	QSI SDR-081
Physical Dimension	128.0 x 12.7 x 126.1 [mm] (W * H * D)
Weight	290g
Loading	Manual tray loading
Ejection	Manual eject using the eject button Auto eject using the eject command on software
Host Interface	IDE (ATAPI)
Average Access Time	150ms (DVD-9)/120ms(DVD-5)/95ms(CD) Typ.
Full Stroke Access Time	340ms (DVD-9)/270ms(DVD-5)/200ms(CD) Typ.
Disc Speed	3,400 rpm(DVD); 5,100 rpm(CD)
Data Transfer Rate (burst)	16.7 MByte/s (PIO Mode 4) 16.7 MByte/s (Multi word DMA transfer mode-2) 33.3 MByte/s (Ultra DMA transfer mode-2)
Data Transfer Rate (sustained)	Max. 11.08Mbyte/s (DVD) ; Max.3,600Kbyte/s(CD)
Starting Time	Typical 4 sec / Max. 10 sec (from stand by to ready)
Data Buffer Capacity	512 KB
Supply Voltage	+5VDC
MTBF	60,000POH or more

A.6 CD-RW Drive Specification

Drive Manufacturer	MKE UJDA330FC1-Z

Physical Dimension	128.0 x 12.7 x 129 [mm] (W * H * D)
Weight	250g +/- 10g
Loading	Manual tray loading
Ejection	Manual eject using the eject button Auto eject using the eject command on software
Host Interface	Enhanced IDE (ATAPI)
Average Access Time	150ms Typ.
Data Transfer Rate (burst)	16.7 MByte/s (PIO Mode 4) 16.7 MByte/s (Multi word DMA transfer mode-2) 33.3 MByte/s (Ultra DMA transfer mode-2)
Data Transfer Rate (sustained)	Max. 2,100Kbyte/s (CD-RW) ; Max.3,600Kbyte/s(CD)
Data Write Rate	Max. 1,200Kbyte/s (CD-R) ; Max.600Kbyte/s(CD-RW)
Starting Time	Max. 10 sec (from stand by to ready)
Data Buffer Capacity	2MB
Supply Voltage	+5VDC +/- 15%
MTBF	50,000POH or more

A.7 Keyboard Specification

Keyboard Type	JME K9801
Type of key switch	Membrane (PE) Switch
Number of keys	87 keys with embedded numeric keypad
Compatibility	Enhanced 101/102 emulation
Travel	3.0 mm ± 0.3 mm
Keyboard Height	6.8 ± 0.3 mm 7.0 ± 0.3 mm (SPACE Key)
Keycap Pull Off Force	≥ 500g
Supply Voltage	6V
Operating Temperature	-10 to 60 degrees Celsius

A.8 Touch Pad Specification

Touch Pad Type	Synaptics GlidePoint TM41PD-351
Interface	PS/2 (compatible with Microsoft Mouse Driver)
Supply Voltage	5V
Supply Current	4.0mA (Max) Operating
Dimension	W65 x H49 x D2.82 (D1.07 PCB) mm
Weight	8g.
Operating Temperature	0 to 60 degrees Celsius
Storage Temperature	-40 to 65 degrees Celsius

A.9 Intemal Modem Specification

Modem Type	Askey 1456VQL19R-4
Chipset	Lucent Mars3 1648

Wake Up Function	Supports Ring-in Resume Wake Up function
Connection Mode	V.90 Kbps
Speakerphone	Full duplex speakerphone (FDSP)
Fax Transmission Way	Half Duplex
Modem Speed	56 Kbps
Modulation Format	V.90 PCM

A.10 Internal LAN Specification

LAN Type	Intel 82559
LAN Chip Interface	Mini-PCI Bus
Speed	10/100 Mbps
Wake Up Function	Supports Wake-on-LAN (WOL) function

A.11 Power Supply

AC POWER ADAPTER (LITEON)	
Adapter Type	Liteon PA1600-01
Input Voltage	100 to 240VAC
Input Frequency	50 to 60 Hz
Input Current	1.32A Max at 110VAC 0.66A Max at 220VAC
Efficiency	83% Min
In-Rush Current (Cold Start)	50A Max at 100 VAC 100A Max at 240 VAC
Output Power	60W
Output Voltage	+19Vdc (main)
Output Current	3.16A (Max)
Over Voltage Protection	24V Max
Over Current Protection	19V / 5A (max)
LED Display	Yellow LED (On / Off)
Dimension	L110 x W50 x H29 [mm]
Weight	250g
DELTA ADP-65DB	
Adapter Type	Delta ADP-65DB
Input Voltage	90 to 264VAC
Input Frequency	47 to 63 Hz
Input Current	1.5A Max at 110VAC 0.75A Max at 220VAC
Efficiency	85% Min
In-Rush Current (Cold Start)	50A Max at 100 VAC 100A Max at 240 VAC
Output Power	60W
Output Voltage	+19Vdc (main)

Output Current	3.42A (max)
Over Voltage Protection	24V (Max)
Over Current Protection	19V / 5A (max)
LED Display	Green LED (On / Off)
Dimension	L114.5 x W49.5 x H29 [mm]
Weight	275g
NICKEL-METAL HYDRIDE (NI-MH) BATTERY PACK	
Model	Sanyo Ni-MH Rechargeable Smart Battery
Cell Number	8
Rating (Nominal) Voltage	9.6V
Typical Capacity	3800 mAH
Watts	50 W (max)
Charging Current	1700mAh
Charging Efficiency	95%
EVD1	8.8V
EVDF	8.0V
LITHIUM ION (LI-ION) BATTERY PACK	
Model	Sanyo Li-Ion Rechargeable Smart Battery
Cell Number	8
Rating (Nominal) Voltage	14.4V
Typical Capacity	3800 mAH
Watts	51.84 W
Charging Voltage	16.8V
Charging Efficiency	100%
EVD1	14.0V
EVDF	12.0V

A.12 Inverter Specification

Input Voltage	5.0V
Start Voltage	1200Vrms (min)
Output Current	6mA (max)
Frequency	30~70KHz
Efficiency	75% (min)
Brightness Control Voltage	0.94~1.86V

A.13 DC/DC Specification

Controller	MAX1631
Input Voltage	8 ~ 20V
Output Current	4A (5V) / 4A (3.3V) / 100mA (12V)
Frequency	200KHz
Support Mode	OVP / OCP

A.14 Charger Specification

Controller	Mitsubishi 3886X
Input Voltage	18.5 ~ 20V
LITHIUM ION (LI-ION) BATTERY PACK	
Max. Temperature	60 degrees
Max. Charger Voltage	4.35V / cell
Charger Entry Temperature	0 – 50 degrees
Max. Timer	300 minutes
Trickle Charger Detect	0 < V < 3V / cell
Output Current (system off)	1.6A (Min) / 1.7A (Typ) / 1.8A (Max)
Output Current (system on)	constant power
Trickle Charger Current	120mA
Ripple & Noise	500mV
Efficiency	90%

A.15 Mechanical Specification

Unit Dimensions (W x D x H) in millimeters	308 x 268 x 39 mm(front), 42(rear)
Unit Weight	Approximately 3Kg (6.6 lbs) with 14.1" LCD System with HDD, FDD, CD-Rom & One Li-Ion Battery Pack

A.16 Environmental Requirements

Temperature Operating Temperature Storage Temperature	 5^{O}C to 35^{O}C -20^{O}C to 60^{O}C
Humidity Operating Storage	 10% to 80% RH without condensation 5% to 90% RH without condensation
Shock (Non-operating) Unpacked	 Acceleration: 30G/50G Duration Time: 11ms No. of Times: 3 Times Direction: 6 face
Drop Package	 Drop Height: 91cm (under 10Kg) 76cm (over 10Kg) Drop Phase: 1 corner, 3 line, 6 face
Electro-Static Discharge (ESD)	Contact: +/- 6KV Air: +/-10KV