2. Product specification and feature

2.1 Product Specifications

2.1.1 Product Overview

Item	Descriptions	Remark
Basic Model	SCX-4725FN(4-in-1 Flatbed MFP) SCX-4725F(4-in-1 Flatbed MFP)	
Target User	SOHO, Economical(Speed/Price) Customer	
Customer Benefits (Sales Points)	- Compact Size - 24ppm/A4, 24ppm/Letter fastest speed in its price class - Favorite Copy - ID Card Copy - Toner Save	
Key Specification	- up to 24ppm/A4(Up to 24ppm/Letter) - 250 sheets Multi-Purpose type paper input/100 sheets Paper Output - 3,000pages toner capacity - 600dpi Print/Copy Resoulusion - Samsung Print Language - 32MB System memory - 30 ADF - 33.6 Kbps Fax Modem - 100 Speed Dial - 72 Hour Battery Back-up	

2.1.2 Specitications

- Product Specifications are subject to change without notice. See below for product specifications

2.1.2.1 General Specitications

Item		Descriptions (SCX-4725FN / SCX-4725F)
Major Features		Copier, Print, Scan, Fax(SCX-4725FN)
Net Dimension (WxDxH)		438(W)*374(D)*368(H)(17.2x14.7x14.5")
Net Weight (Inc. Toner Cartridge)		11.2kg
CPU		Chorus-M (300MHz)
LCD		2 Line x 16 characters / 2Line x 8 characters(for china and korea)
Toner Save		Yes (With toner save button)
I/O Interface		USB2.0
Network Interface		Yes
OS Compatibility		Windows 98/Me/NT4.0/2000/XP, Various Linux OS (via USB interface only) including Red Hat 8.0~9.0, Fedora core 1~3, Mandrake 9.0~10.2, and SuSe 8.2~9.2, Mac 10.3
Power Requirement		110 ~ 127 VAC, 50/60 Hz, 5.5A 220 ~ 240 VAC, 50/60 Hz, 3A
Power Consumption		Sleep Mode : Under 12W Standby Mode : 70W Average : 400W (Print Mode)
Energy Star Compliant		Yes
Power Switch		Yes
Noise	Warm up Stand by Coping Printing	49 dBA 35 dBA 55 dBA 53dBA
Warm up time	from Power On Status from Sleep Mode (Recovery time)	Less than 30 seconds Less than 30 seconds
Max. Monthly Volume	Print	10,000 pages
	Scan	ADF: 2,500 pages, PLATEN: 1,700 pages
Average Monthly Print Volume		700 pages
Average Monthly Scan Volume		150 pages
Machine Life	ENGINE	5 years or 50,000 Pages. Whichever comes first
	SCANNER	ADF : 30,000 Pages, Platen : 20,000 Pages
Operation conditions	Temperature	10°C ~ 32 °C (50°F ~ 89°F)
	Humidity	20 % ~ 80 % RH
Approval		Class B
Device Memory		32MB
Page Counter		Yes
Print Configuration Sheet(System Data)		Yes

2.1.2.2 Print Specifications

Item		Descriptions (SCX-4725FN / SCX-4725F)
Method		Laser Beam Printing
Speed		Up to 24ppm in A4 (24ppm in Letter)
Emulation		PCL
Power Save		Yes(Interval option: 5, 10,15, 30, 45 minute)
Resolution	Normal	1200 x 1200 dpi
	RET	-
Memory		32MB
First Print Out	From Stand by	Approx. 10 seconds
Time	From Cold Status	Less than 30 seconds
Duplex	Print	Manual
WHQL Compliant		Window XP
Printable Area		A4: 201.6x288.6mm
		LTR: 207.6x270.6mm
		Legal: 207.6x347.6mm
		Folio: 207.6x322.6mm
Halftone (Gray Scale)		256 levels

2.1.2.3 Scan Specifications

Item		Descriptions (SCX-4725FN / SCX-4725F)
Compatibility		Twain standard / WIA Standard (Window 2000/XP)
Scan Method		600dpi Color CIS(Contact Image Sensor) Module
PC Scan Speed	Lineart, Halftone	10sec Platen(13sec ADF)
through Platen	Gray	23sec Platen (26sec ADF)
	Color 300dpi	65sec Platen(70sec ADF)
Resolution	Optical	600 x 600 dpi
	Enhanced	4800 x 4800 dpi
Halftone		256 levels
Scan Size	Max. Document Width	Max.216mm (8.5")
	Effective Scan Length	297 mm (11.7")
	Effective Scan Width	Letter/Legal: 208mm(8.2")A4: 202mm
Scan-to	Button	Yes
	Application	Yes
Scan Depth	Color	24 bit
	Mono	1bit for Line art, Halftone, 8 Bit for Gray scale

2.1.2.4 Copy Specifications

Item		Descriptions (SCX-4725FN / SCX-4725F)
Copy Speed		Up to 22ppm in A4 (22ppm in Letter)
Resolution	Optical	600*600 dpi (Scan:600*600dpi, Print: 600*600dpi) - Text & Text/Photo mode : 600*300dpi(ADF, Platen) - Photo mode : 600*600dpi (Platen), 600*300dpi(ADF)
	Enhanced	-
First Copy Out Time	Stand by	Approx. 16 seconds(ADF), Approx. 11 seconds(Platen)
	From Power Save Mode (110V only)	Approx. 46 seconds(ADF), Approx. 40 seconds(Platen)
Original Image type selection		Text, Text/Photo, Photo
Zoom Range		25-400%(Platen), 25-100%(ADF)
Multi Copy		1~99 Pages
Preset		[Original(100%)], [A4 →A5(71%)], [LGL→LTR(78%)], [LGL→A4(83%)], [A4 →LTR(94%)], [EXE →LTR(104%)], [A5 →A4(141%)], 25%, 50%, 150% 200%, 400%, [Custom: 25-400%)]
Darkness Control		3 level (Light, Normal, Dark)
Auto return to default mode		Yes (after 1 minute)- Time out option: 15, 30, 60, 180 sec., Off
Changeable Default mode		Darkness, Original Type, Reduce/Enlarge, No. of Copies
ID Card Copy	2-up	Yes (ADF Only)
	4-up	Yes (ADF Only)
	Collation	Yes (ADF Only)
	Autofit	Yes (Platen Only)
	LD Card Copy	Yes (Platen Only)
	Clone	Yes (Platen Only)
	Poster	Yes (Platen Only)

2.1.2.5 Telephone Specifications

Item		SCX-4725FN
Handset		No
On hook Dial		Yes
Search		Yes(Phone Book)
1-Touch Dial		10 ea (0~9)
Speed dial		90 locations(10~99)
TAD I/F		Yes
Tone/Pulse		Tone →Default, Pulse →Changing in Tech Mode
Pause		Yes
Auto Redial		Yes
Last Number Redial		Yes
Distinctive Ring		Yes
Caller ID		No
Extention Phone Interface		Yes
Report & List	Tx/Rx Journal	Yes
Print out	Confirmation	Yes
	Help List	No
	Auto Dial List	Yes
	System Data	List all user setting
Sound Control	Ring Volume	Yes(Off,Low,MED,HIGH)
	Key Volume	Yes(On,Off)
	Alarm Volume	Yes(On,Off)
	Speaker	Yes(On,Off, Comm)

2.1.2.6 Fax Specifications

Item		SCX-4725FN
Compatibility		ITU-T G3
Modem Speed		33.6Kbps
TX Speed		3sec
Compression		MH/MR/MMR/JBIG
Color Fax		Yes(Tx Only)
ECM		Yes
Resolution	Std	203x98dpi
	Fine	203x196dpi
	S.Fine	300x300dpi
	Photo	203x196dpi
	Color	200x200dpi
	Auto Switching	Yes
Scan Speed	Standard	approx. 3sec (ADF)
		approx. 5sec (Platen)
	Fine	approx. 7sec (ADF)
		approx. 8sec (Platen)
	S.Fine	approx. 7sec (ADF)
		approx. 8sec (Platen)
Rx fax duplex print out		No
Multiple page scan speed (Memory Tx.)		7 cpm / Ltr (Standard Resoution Res.)
Receive Mode		Fax, TEL, Ans/Fax, DRPD
Memory	Capacity	2MB (When Power off Memory Back up)
	Optional Memory	No
	Max locations to store to 1 Group Dial	99 locations
	Fax Forward	Yes(On/Off)
	Broadcasting	109 locations(Max locations)
	Cover page	NO
	Delayed fax	Yes
	Memory RX	Yes
Functions	Voice Request	No
	TTI	Yes
	RTI	Yes
	Polling	No
	Earth/Recall	No
	Auto Reduction	Yes
	RDS	Yes
Junk Fax barrier		Yes
Security Receive		Yes
Memory Back-up		Max. 72hours

2.1.2.7 Paper Handling Specifications

Item	SCX-4725FN / SCX-4725F
Input Capacity and Types	250-sheet Cassette Tray (75 g/㎡, 20 lbs)
Output Capacity and Types	100-sheet Face Down(75 g/㎡, 20 lbs)
Manual Tray	1 sheet
Media size	A4, A5, A6, Letter, Legal, Folio, Executive, ISO B5, JIS B5, Monarch, Envelope, No.10, DL, C5, C6
	76 x 127 mm (3" x 5") ~ 216 x 356 mm (8.5" x 14")
Media Type	Plain Paper, Transparency, Label, Envelope, Tick, Thin, Bond, Color Paper, Card Stock, Preprinted
Paper Weight	16~24lb (60 to 90g/㎡), Cassette Tray
	16~43lb (60 to 165g/㎡) for 1 sheet, Manual Tray
ADF Capacity	Up to 30 sheets of 20lb(75g/㎡) paper
ADF Document Size	Up to Legal

2.1.2.8 Software Specifications

Item		SCX-4725FN / SCX-4725F
Compatibility	DOS	No
	Win 3.x	No
	Win 95	No
	Win 98/ME	Yes
	Win NT 4.0	No
	Win 2000	Yes
	Win XP	Yes
	Mac	Yes (10.3)
	Linux	Yes
Driver	Printer	PCL
	TWAIN	Yes
	WIA	Yes
	ScanToPC	Yes
	PC-FAX	Yes (Send only)
Application	RCP	Yes
	Status monitor	Yes
	SmarThru4	Yes

2.1.2.9 Accessory

Item	SCX-4725FN	SCX-4725F
Quick Setup Guide	Yes (include Setup Guide and Function Guide)	
Quick User Guide	Yes (Korea Only)	
S/W CD ROM	3 CD (Contents; Electronic User Manual, SmarThru, Print Driver, Twain Driver, RCP)	
Toner Cartridge	1 EA	
Power Cable	1 EA	
Telephone Jack	No	1 EA
Printer Cable	No	No
Tray Coner	Yes	Yes

2.1.2.10 Consumables

Item	SCX-4725FN / SCX-4725F
Type	Single Cartridge
설치방법	Front door open and front loading
Toner Yield	3,000 pages at ISO 19752 Std. Coverage(Ships with 1,000 pages Starter Toner Cartridge)
Code	SCX-4525D3
Level Sensor	-

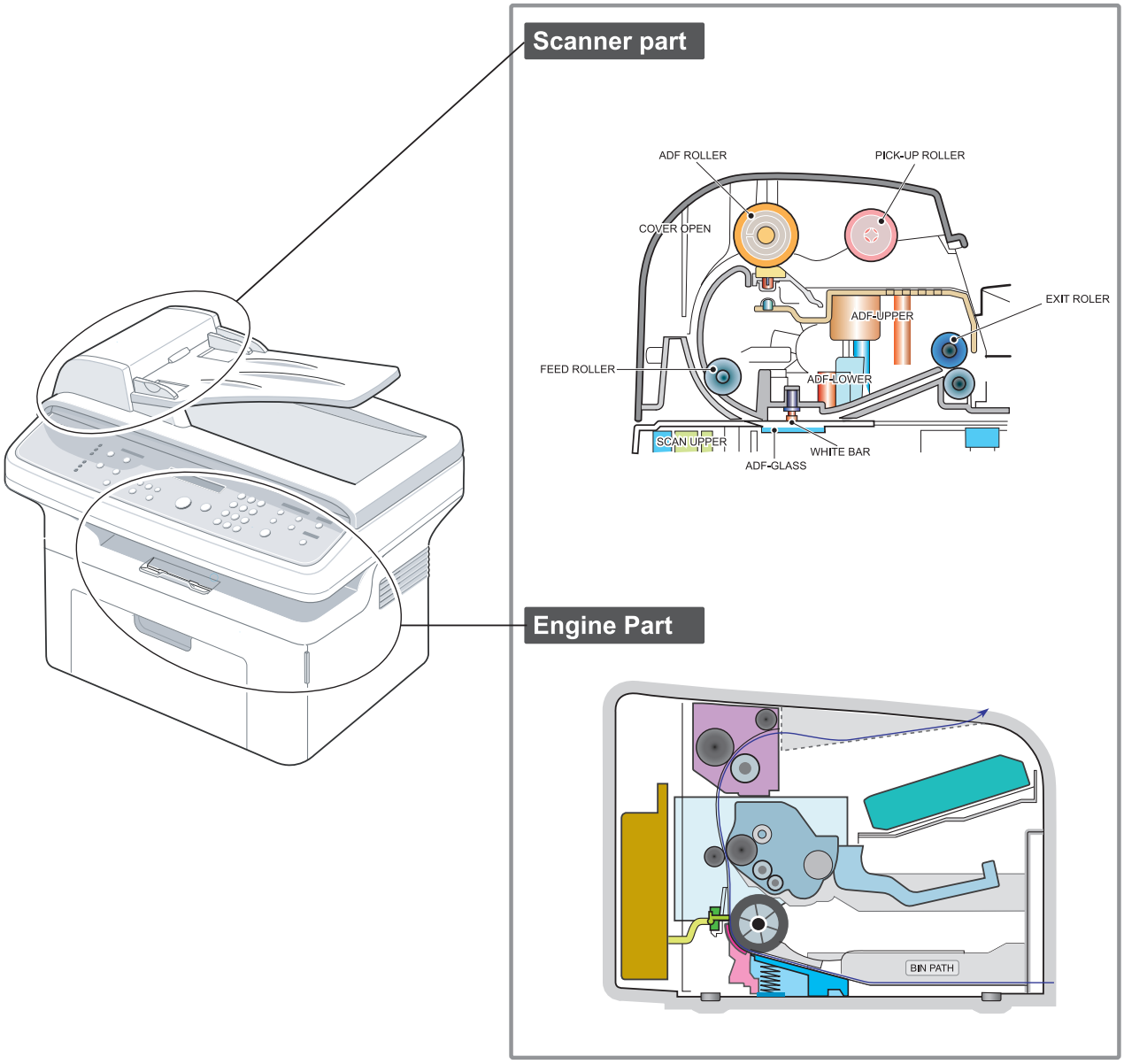
2.1.3 Model Comparison Table

Item		SCX - 4725FN (Whitney-2 24ppm)	Brother MFC 7820N	HP LJ 3055	Canon MF 5770
Model Image					
Print	Speed	24 ppm/A4 (25ppm/Ltr)	20 ppm/A4 (20ppm/Ltr)	18 ppm/A4 (19ppm/Ltr)	20 ppm/A4 (21ppm/Ltr)
	Resolution	1200 x 1200 dpi	2400 x 600 dpi	Up to 1200 x 1200 dpi	1200 x 600 dpi quality
	Emulation	PCL6, PS3	PCL6, PS3	PCL6, PS3	GDI
Copy	Speed	24 ppm/A4 (25ppm/Ltr)	20 ppm/A4 (20ppm/Ltr)	18 ppm/A4 (19ppm/Ltr)	20 ppm/A4 (21ppm/Ltr)
	Resolution	600 x 600 dpi	600 x 300 dpi	600 x 600 dpi	600 x 600 dpi
Scan	Resolution (Optical)	600 x 2400 dpi	600 x 2400 dpi	Up to 600 dpi	1200 x 2400 dpi
Fax	Modem Speed	33.6 Kbps	33.6 Kbps	33.6 Kbps	33.6 Kbps
	Memory	Approx. 320 pages	Approx. 600 pages	2 MB (Up to 110 pages)	Approx. 256 pages
	Auto Dial	1-touch 10 / Speed 190	208 Locations	119 Locations	Speed 12 / Coded 100
Paper	Input Capacity	250 -sheet MP Tray	250 - sheet CST Tray	250 -sheet MP Tray	250 - sheet CST Tray
	ADF Capacity	30 sheets	35 sheets	50 sheets	50 sheets
General	Net Dimension	438 x 374 x 368mm (TBD)	432 x 395 x 294 mm	497 x 406 x 393 mm	486 x 477 x 442mm
	Interface	USB 2.0, Ethernet 10/100 Base TX	USB 1.1, IEEE 1284, Ethernet 10/100 Base TX	USB 2.0, Ethernet 10/100 Base TX	USB 2.0, Ethernet 10/100 Base TX
Cons.	Type	Single Cartridge	2-piecese Cartridge	Single Cartridge	Single Cartridge
	Yield	3K (Starter 1.5K)	Toner 2,5K/ Drum 12K (Starter 1,5K/ 12K)	2K	2.5 K

2.2 System Overview

2.2.1 System Layout

The SCX-4725FN/4725F is roughly made up Main Control part, Operation Panel part, Scanner part, Line Interface part and Power part. Each Part is separated Module which focus on common and standard design of different kind products. main control part adopting Fax & LBP Printer exclusive Controller is chorus-M CPU(ASIC) and 1 Board. Scanner part is composed of ADF and Platen and is connected with Main by Harness.



2.2.1.1 Feeding section

There is a universal cassette which automatically loads paper and the manual feed which supplies paper single sheet at a time. The cassette has a friction pad which separates paper to ensure single sheet feeding, and it has a sensor, which checks when the paper tray is empty.

- Feeding Method: MP Cassette Type
- Feeding Standard: Center Loading
- Feeding Capacity: Cassette-150 sheets (75g/m2, 20lb paper standard)
  Manual 1 sheet (Paper, OHP, Envelop, etc.)
- Paper detecting sensor: Photo sensor
- Paper size sensor: None

2.2.1.2 Transfer Ass'y

This consists of the PTL (pre-transfer lamp) and the Transfer Roller. The PTL shines a light onto the OPC drum. This lowers the charge on the drum's surface and improves transfer efficiency.
The transfer roller transfers toner from the OPC drum surface to the paper.

- Life expectancy: Over 50,000 sheets (at 16~30°C)

2.2.1.3 Driver Ass'y

- Gear driven power unit. The motor supplies power to the paper feed unit, the fuser unit, and the toner cartridge.

2.2.1.4 Fixing Part(Fuser)

- The fuser consists of the Heat Lamp, Heat Roller, Pressure Roller, Thermistor, and Thermostat. It fixes toner to the paper using pressure and heat to complete the printing job.

2.2.1.4(a) Temperature-Intercepting Device (Thermostat)
The thermostat is a temperature sensing device, which cuts off the power to the heat lamp to prevent overheating fire when the heat lamp or heat roller overheats.

2.2.1.4(b) Temperature Detecting Sensor (Thermistor)
The Thermistor detects the surface temperature of the heat roller, this information is sent to the main processor which uses this information to regulate the temperature of the heat roller.

2.2.1.4(c) Heat Roller
The surface of the Heat Roller is heated by the Heat Lamp. As the paper passes between the Heat and Pressure rollers the toner is melted and fixed permanently to the paper. The surface of the roller is coated with Teflon. This ensures that toner does not adhere to the roller surface.

2.2.1.4(d) Pressure roller

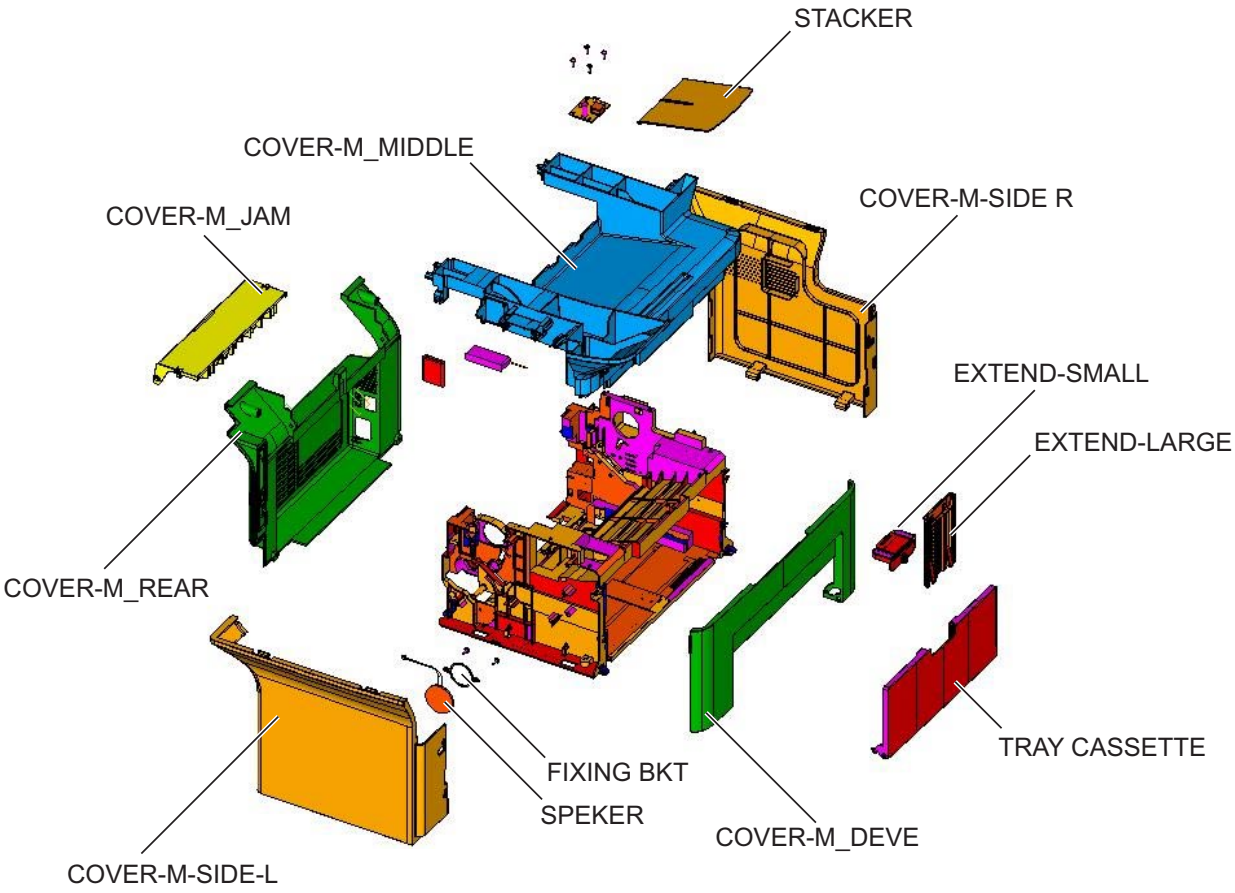
The Pressure Roller mounted under the heat roller, it is made of a silicon resin, and the surface of the roller is coated with Teflon. This ensures that toner does not adhere to the roller surface.

2.2.1.4(e) Safety Features

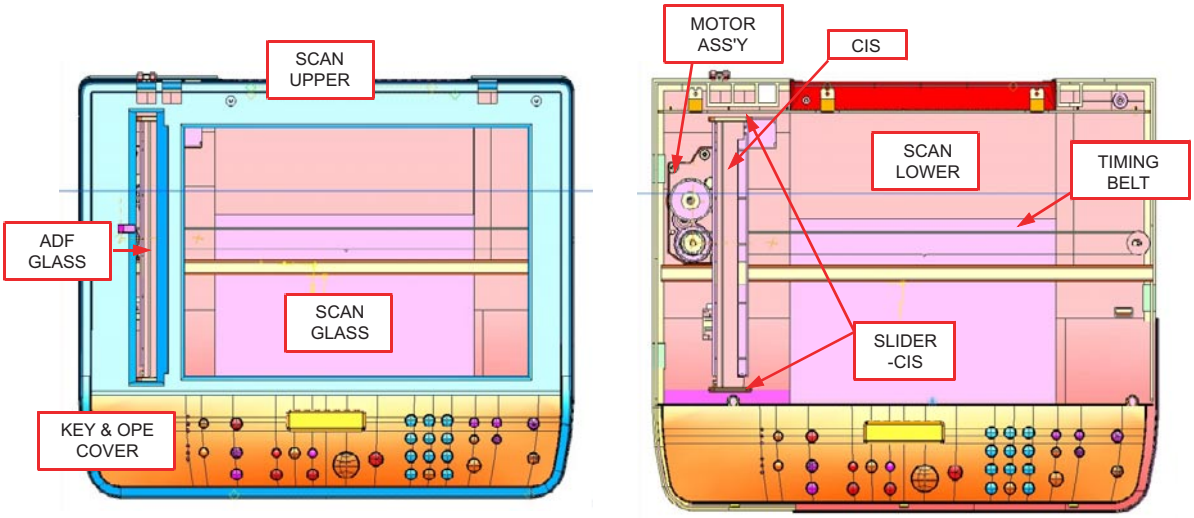
• To prevent overheating
  - 1st protection device: Hardware cuts off when overheated
  - 2nd protection device: Software cuts off when overheated
  - 3rd protection device: Thermostat cuts off mains power to the lamp.

• Safety device
  - Fuser power is cut off when the front cover is opened
  - LSU power is cut off when the front cover is opened
  - The temperature of the fuser cover's surface is maintained at less than 80°C to protect the user and a caution label is attached where the customer can see it easily when the rear cover is opened.

[Case part figure]



[Scan part figure]



2.2.2 Engine H/W Specification

1) Recording Method : LSU(Laser Scanning Unit)
2) Printing Speed : 24ppm
   (In continuing printing base Letter, printing pages from 2nd to last during 1min)
3) Recording Density : 1200 dpi
4) Cassette Capa. : Cassette ; 250sheets(75g/㎡ Base), 1-sheet Feeding : N/A((DRIVE Selection : Paper, OHP, Envelop - 1 sheet)
5) Manual Tray : All paper 1 sheet
6) Paper Size : Cassette ,Manual ; Width = 76 ~ 216mm, Length = 125mm ~ 356mm
7) Effective recording size
   - A4 :202 x 291 mm
   - Letter : 208 x273mm
   - Legal : 208 x 350 mm
   - Folio : 208 x 325 mm
   - TopMargin: 2 ±2 mm
   - Left, Right Margin : 2 ±2 mm

8) CRU(Toner Cartridge)Life : 3,000pages Printing(A4, ISO Standard Pattern Printing)
9) First Print Out Time : within 11sec (Standby)
10) Warming up time : within 35sec (Ambient : 25 °C)

2.2.2.1 Main Board Control Part

Main control part of SCX-4725FN is made of ASIC(CPU, Image processor, PC I/F part include, Scan interface part, FAX Modem part and Printing process I/F part. CPU handles the BUS control, I/O interface, scan interface, PC interface and other miscellaneous driver circuit.

1) Main Board
   - Main Board has a function of sending Current Image Video Data to LSU of the machine, controlling motor Driving Circuit and monitoring Paper Exit Sensor, Cover Open switch, OPE Panel Inputs.
2) Main Controller
   - CPU : Chorus-M is the main CPU and is made up on the 32bit RISC architecture using ARM 920T core. Main CPU controls the whole system according to the program code which stored in the Flash-ROM memory.
   - Operation Frequency : CPU Core -> over 300MHz, System Bus -> 100MHz
   - Summary of the Key Function Block:
     · 1.3V for internal Core, 3.3V for I/O Pad with 16KB I-Cache and 16KB D-Cache.
     · Image Processor included.
     · On-Chip clock generator with PLL.
     · Memory and External Bank Control.
     · DMA Control (16-Channel)
     · Interrupt Control.
     · 2-port USB Host/1-port USB device(ver 1.1) interface control.
     · Parallel interface control.
     · UART(1-Channel)

· Synchronous Serial Interface Control.
· A/D Converter(10-bit, 8channel).
· General I/O Port control.
· RTC with calendar function.
· S/W Assistant function(Rotator)

- Flash Memory : Stores system program and can be updated to the newer system program code through the PC interface. It stores the FAX Journal List, One Touch dial number, speed dial number, and machine configuration setup data.
  · Capcity : 16 Mbyte (NOR Type)
  · Access Time : 70 nsec

- SDRAM : SDRAM is used for Print Buffer, Scan buffer when scanning, ECM Buffer when FAX Receiving, and system working memory.
  · Capacity : 32 Mbyte
  · Access Time : 166MHz(Max)
  · Data Backup : 48 Hours
  · Backup Battery Charging Time : 100hours when completely discharged.

2.2.2.2 Scan Part

1) Image Signal Input Part
- Image Signal from CIS has a level of about 1.2V and is goes to ADC of Chorus2. After ADC, CIS analog signal will be converted to 8-bit Digital signal.

2) Image Processing
- On the surface of the original paper, the light from the CIS LED reflected and goes to the CIS Sensor. Then the light is converted to the appropriate voltage suitable for ADC input. Analog signal from CIS sensor is used for ADC input then is converted to 8-bit digital data. Image processor of the Chorus2 will do the Shading correction function at first, then Gamma correction function next. After then, the data goes to different module according to the copy or FAX resolution mode. When Text mode, the image data goes to LAT module, when Photo mode, the image data goes to Error Diffusion module, when PC-Scan mode, the image data goes directly to the PC through DMA access.

  · Summary of the Image sensor interface is as below;
    - Minimum Scan Line Time :1.5ms
    - Scan Resolution : 600*600 dpi
    - Scan Width : 208mm
    - Function
      · White Shading Correction
      · Gamma Correction
      · CIS Interface
      · 256 Gray Scale

3) CIS Driving Part

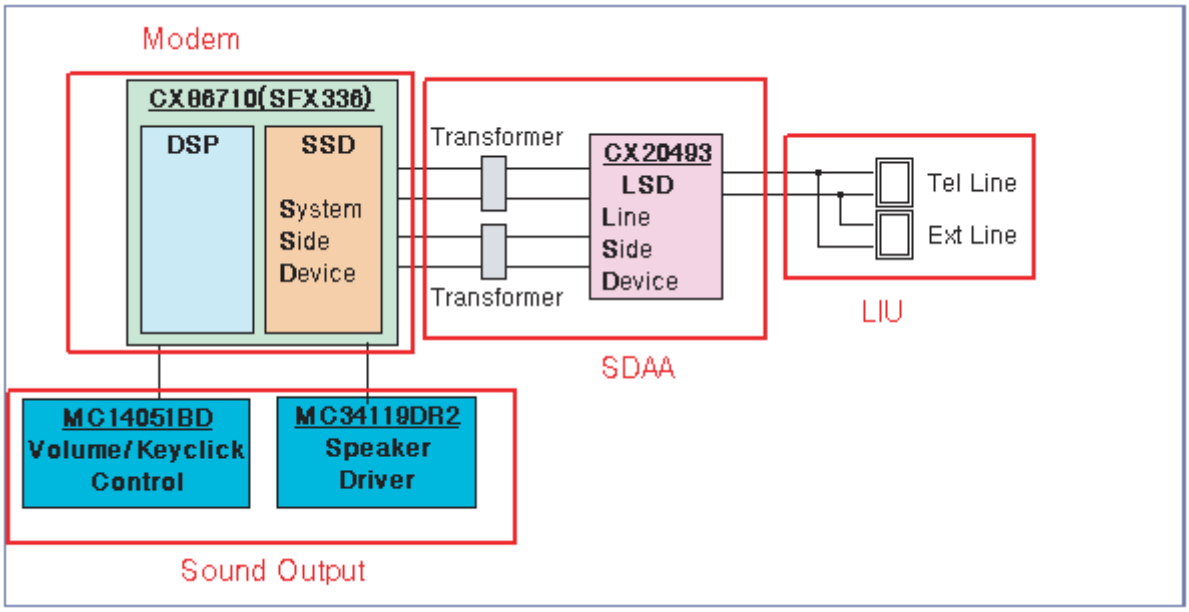
- CIS Supply Voltage : +3.3V
- CIS Max frequency : 5MHz
- CISLinetime
  - · Fax/Copy - 1.5ms
  - · PC-Scan - 4.5ms
- White output volt. : Max 0.8V

4) ADF Driving Part : Driving ADF Stepper motor, and the maximum motor speed is 2000PPS.
- MOTOR DRIVER : A3978(Allegro)
- Driving Voltage : 24V DC
- Phase : 2-2 Phase 2000PPS at Quick Scan,
  2-2 Phase 1000PPS AT Fine Scan,
  2-2 Phase 667PPS AT Super Fine Scan

2.2.2.3 FAX Section

Modem Part

BLOCK DIAGRAM



Implemented by based on Conexant DAA (Data Access Arrangement) Solution, and is roughly composed of two kinds Chip Solution

- CX86710 (SFX336): Existing Modem Chip which adds SSD (System Side Device) for interfacing between LSD and DIB of FM336Plus Core

- CX20493 (LSD) : LIU (Line Interface Unit) Chip which is controlled by SSD and satisfies each PSTN Requirements by modulating internal Configuration with connecting Tel Line.

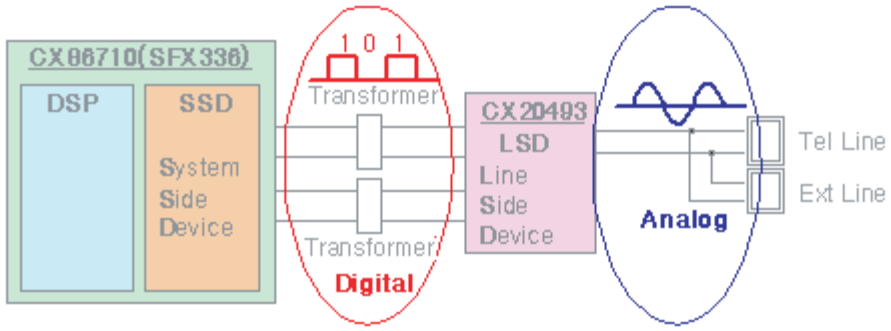
Modem (SFX336) specification.

- 2-wire half-duplex fax modem modes with send and receive data rates up to 33,600 bps
- V.17, V.34, V.29, V.27 ter, and V.21 Channel 2
- Short train option in V.17 and V.27 ter
- PSTN session starting
- V.8 and V.8bis signaling
- HDLC support at all speeds
- Flag generation, 0-bit stuffing, ITU CRC-16 or CRC-32 calculation and generation
- Flag detection, 0-bit deletion, ITU CRC-16 or CRC-32 check sum error detection
- FSK flag pattern detection during high-speed receiving
- Tone modes and features
- Programmable single or dual tone generation
- DTMF receiver
- Tone detection with three programmable tone detectors
- Receive dynamic range:
- 0 dBm to -43 dBm for V.17, V.29, V.27 ter and V.21 Channel 2
- 9dBm to -43 dBm for V.34 half-duplex
- Digital speaker output to monitor received signal
- Two16-byte FIFO data buffers for burst data transfer with extension up to 255 bytes
- V.21 Channel 1Flag detect
- V.21 Channel 1Flag detect
- +3.3V only operation
- Typical power consumption
- Normal mode: 264 mW

Signal Transition of DAA Solution

Line Interface Signal of Tel Line and LSD is Analog Signal.

2) there is A/D, D/A Converter in LSD, so Analog Signal from Tel Line is converted in Digital through A/D Converter in DAA and transfer to SSD by DIB Capacitor
Digital Signal from SSD is converted to Analog by D/A Converter in DAA and transfer to Tel Line



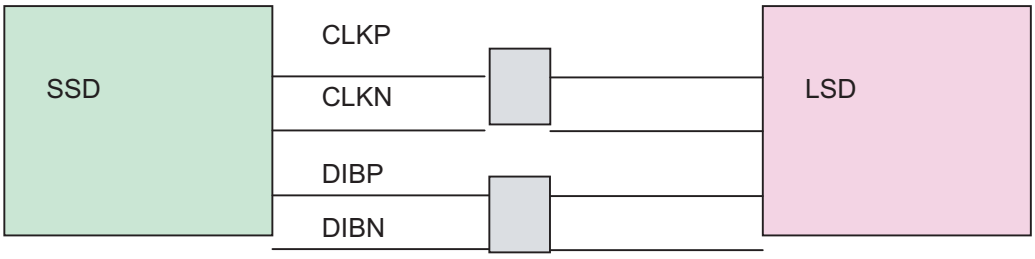
Transformer transfer Clock from SSD to LSD and Clock Frequency is 4.032MHz.

LSD full wave rectifies Clock to use as inner Power supply and also use as Main Clock for DIB Protocol Sync between LSD and SSD. Transformer transfer Clock by separating Primary and Secondary, and
amplifies Clock Level to LSD by Coil Turns Ratio 1:1.16.

■ Clock

- Clock is supplied by transformer from SSD to LSD, and there is PWROUT to adjust output impedance of Clock

Out Driver is inside SSD and CLKSHIGH Resistor to adjust duty of HLPWR Resistor and Clock.



Clock from SSD to LSD has Differential structure of 180 phase difference for Noise Robustness

DIB Data transfer Data from SSD to LSD by Transformer, and also transfer specific data from LSD to SSD.

After transferring data from SSD, RSP is transferred and LSD recognizes RSP and change LSD to output Driver transfer Data to SSD.

DIB Data form SSD to LSD by Transformer has Differential structure of 180 phase difference between DIBP and DIBN for Noise Robustness

2.2.2.4 Line Interface Part

This is Connection Part between system and PSTN(Public Switched Telephone Network), and primary circuit is usually located. Main functions are Line Interface, Telephone Connection and Line Condition Monitoring.

1 Telephone Line Connection

① Modular Plug : RJ-11C

② LIU PBA Modular Type : 623 PCB4-4

③ Line Code Length : 2500 ± 50mm

④ Line Code Color : Black

ON HOOK state Characteristic

1) DC Resistance

① DP Dial Mode (Direct Current 30mA) : 50 ~ 300ohm

② DTMF Dial Mode (Direct Current 20mA) : 50 ~ 540ohm

2) Ring Sensitivity

① Ring detection Voltage : 40Vrms ~150Vrms (condition :Current=25mA,Frequency=15Hz)
product Margin : 30Vrms ~150Vrms

② Ring detection Frequency : 15.3Hz ~68Hz (condition : Voltage=45Vrms,Current=25mA)
product Margin : 15Hz ~70Hz

③ Ring detection Current : 20mA ~ 100mA (condition : Voltage=40Vrms,Frequency=20Hz)
product Margin : over 15mA

3) False Ring Sound

① Ring Frequency : 750 Hz + 1020 Hz

② Ring interrupt Cycle : On/Off depending on input Ring Signal Cycle.

2.2.2.5 Printing Part

Printing Process part is made of PC-Interface part, PVC(Priter Video Controller), LSU control part, High Voltage control part and Fuser Unit control part. PC-interface core is included in the Chorus2 ASIC and controls the PC-interface. LSU control part controls the LSU polygon motor, Laser diode, video data output so thatthe printing image can be made up on the OPC Drum.

2.2.2.6 Engine Paper Feeding

1) Feeding Type : MP Cassette Type
2) Feeding Standard : Center Loading
3) Feeding Qty : Cassette 150 sheets (75g/㎡, 20lb paper standard)
4) 1 sheet (Paper, OHP, Envelope etc.)
5) Separating Type: Cassette - Friction Pad Type
6) Manual Tray : 1 sheet
7) Driver Type : Driving by Gearing from Main Motor
8) Pick_up Roller Driver : Solenoid
9) Pick up Roller Rubber Material : EPDM+IR μ=1.3 or more
10) Pick up Velocity : 94.8731mm/Sec (Process : 93.0667mm/sec)
11) Paper detecting Sensor : Photo Sensor
12) Paper Size Sensor : None
13) Paper Separating Pad Material : NBB 52 °, μ=0.8~1.2
14) Separating Pad Pressure : TBD 150 gf
15) Pick_up Roller RPM : 47.683 RPM
16) Feeding Pressure (Same as Transfer Roller)
17) Paper Exit Type : Face Down
18) Feed Roller Force : TBD Kg.f or more.
19) Spring Feed Tensile Force : TBD gf
20) Feed roller Velocity : mm/sec
21) Feed Roller Material
22) Exit Sensor : Photo Sensor

2.2.3 Develope Process

- Developing Method : Non magnetic 1 element contacting method
- Toner : Non magnetic 1 element shatter type toner
- Toner Qty:35gf /60gf (1k/3k)
- The life span of toner 1k/3k sheets (ISO Std. Coverage)
- Toner Residual Sensor : None
- OPC Cleaning : Use the conventional cleaning blade
- Handling of wasted toner : Discard by collecting waste-toner at waste-toner bin.
- OPC Drum Protecting Shutter : None
- Classifying device for toner cartridge: ID is classified by interruption of the frame channel.
- Development Roller type : conductive elastic roller
- Doctor BLADE Type : Regulating toner layer by pressure
- Charge Roller Type : Conductive Roller Contact-Charge

2.2.3.1 Fuser Specification

1) Heat Lamp
- Heat Lamp Terminal Shape : Terminal Single Type
- Voltage 120 V : 115 ± 5 %, 220 V : 230 ± 5 %
- Capacity : 750 Watt ± 30 W
- Light Qty Distribution : 140%
- Life : 3000 Hr

2) Thermostat
- Thermostat Type : Non-Contact type THERMOSTAT
- Control Temperature : 150°C ± 5°C

3) Thermistor
- Thermistor Type : HF-R0060 (SEMITEC 364FL Type)
- Temperature Resistance : 7 kΩ(180 °C)
- SYSTEM Temperature SETTING
  - Stand by : 165 ± 5°C
  - Printing : 175 ± 5°C(5 minutes before)
    170°C ± 5°C(5 minutes after)
  - Overshoot: 200°C or less
  - Overheat :210°C or less

4) Safety Relevant Facts
- Protecting device when overheating
  - 1st protecting device : H/W cuts off when detecting an overheating
  - 2st protecting device : S/W cuts off when detecting overheating
  - 3st protecting device : Thermostat cuts off the power
- Safety device
  - The power of Fuser is cut-off after front cover is open.
  - The overheating safety device for customer
  - The surface temperature of the Fuser Cover is under 80°C

2.2.4 Sanner Part

600dpi Color CIS Module for Flat bed, SCX-4725FN uses the CIS scanning method

1) CIS SPEC
- Scanning size : 216 mm (width for letter-size)
- Light source : LED
- Scanning sensor: CIS 600/300 dpi
- Scanning mode : Color SCAN / Mono SCAN
- MTF : 30% (300 dpi Chart)
- CIS interface : Analog output
- Power supply : 3.3V
- Clock Frequency: 5.5MHz max.
- Number of output : 1
- LED Current : Green/Blue : 50mA, Red : 60mA
- Clamp Level : 1.4V
- Connection : 12 pin FFC connector (pitch 1.0mm)

2) Scan Resolution

(a) Transmission
- Normal : Vertial: 3.85 Line/mm, Horizontal: 8 Pels/mm :203 x 98dpi
- Fine : Vertial: 7.7 Line/mm, Horizontal: 8 Pels/mm :203 x 196dpi
- Super Fine : Vertial: 11.8 Line/mm, Horizontal: 11.8 Pels/mm ;300 x 300dpi

(b) When Copy : Vertial: 11.8 Line/mm, Horizontal: 23.6 Pels/mm :600x300dpi(ADF)
Vertial: 23.6 Line/mm, Horizontal: 23.6 Pels/mm :600x600dpi(Platen)

3) Half Tone (Gray Scale) : 256 Levels

4) Scan Line Time

(a) Tx
- Normal : 1.5 ms/Line
- Fine : 1.5 ms/Line
- Super Fine : 1.5 ms/Line

(b) Copy : 1.5 ms/Line

(c) Scan
- Color : 4.5msec/line
- Gray : 4.5msec/line
- Mono : 4.5msec/line

5) Scanning Width
- MAX SCAN WIDTH : 216 mm (8.5 inches)
- Effective Scan Width: 208mm

6) ADF Motor

(a) Motor Spec
- 정격전압 : 24VDC
- 정격전류 : 0.6A(Peak)

7) Motor Driver speed & method
(a) FAX Transmission
- Normal Mode : 2000 pps, 2-2
- Fine Mode : 1000 pps, 2-2
- Super Fine Mode : 667 pps, 2-2

(b) Copy Job : 667 pps, 2-2
- max(30sheets) : 50gf
- min(1sheets) : 20gf

8) Document Detect sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED - max current : 30mA
- max voltage : 3.3V

(d) Output - Logic "H" : No Paper
- Logic "L" : Paper

(e) Lever-Sensor DOC : ADF Lower Torsion Spring

9) Regi Detect sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED - max current : 50mA
- max voltage : 3.3V

(d) Output - Logic "H" : No Paper
- Logic "L" : Paper

(e) Lever-Sensor DOC : ADF Lower Torsion Spring

10) Document Scan sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED : - Max current : 50mA
- Max Voltage : 3.3V

(d) Output - Logic "H" : Off(No Position), No Paper
- Logic "L" : On (Doc Position), Paper

(e) LEVER - SENSOR SCAN : Scan Lower Torsion Spring

2.2.5 OPE(Operational Panel Equipment)

1) Ope Panel

OPE Panel has a MICOM Chip on it and communicates with Main CPU using Serial communication Line(SIO). OPE Panel consists of Micom, Key Matrix Part, LED Driving Part and LCD Part.

2) Key Description

No	Part	Feature	Function
1	Common	3*4Key	Dialing and Option Input
		Start	Starting Fax/Copy Job
		Stop/Clear	Cancel Current Job/Return to default
		Menu	Option select
		Upper Level	Return to upper level menu
		Enter	Option select/Execute
		▶	Next menu or Next option item
		◀	Previous menu or Previous option item
2	Save	Toner Save	TONER SAVE MODE select
3	Copy	Reduce/Enlarge	Select ZOOM ratio when copy
		No.of Copies	Select the number of copies
		Original Type	Change Copy Modes(Text,Text/Photo,Photo)
		Darkness	Change the Darkness of the Copied image (Light/Normal/Dark)
		Favorite Copy	Select one of the predefined Copy templates.
4	Fax	Resolution	STANDARD>FINE>SUPER FINE>PHOTO>COLOR
		Phone Book	Search the user defined Phone number.
		Broadcasting	When sending FAX data to many place in the same time.
		On Hook Dial	On Hook Dial
		Redial / Pause	Last number Redial / Pause
5	Scan	Scan to	select [scan to PC], [scan to FAX], [scan to E-mail] function.

3) LCD Part

- Number of Characters : 16 Characters x 2 line
  - · Clock, Date display
  - · System Status display
  - · Alarm, Error Message display
  - · Function Dialog Message display

2.2.6 SMPS & HVPS

It is the power source of entire system. It is assembled by an independent module, so it is possible to use for common use. It is mounted at back of the machine. Power part is divided by two independent PBAs - SMPS PBA and HVPS PBA. SMPS PBA supplies the DC power for driving the system and supplies the AC power to the fuser. SMPS has two output channels : +5V and +24V. HVPS PBA supplies High voltage to the developer part to make a printing image on the paper. High voltages applied to the MHV, THV, DEV, SUPPLY.

2.2.6.1 SMPS

1) AC Input

- Input Rated Voltage : AC 220V ~ 240V / AC 110V ~ 127V
- Input Voltage fluctuating range: AC 180V ~ 270V / AC 100V ~ 135V
- Rated Frequency : 50/60 Hz
- Frequency fluctuating range : 47 ~ 63 Hz
- Input Current : Under 4.0Arms / 2.5Arms
  (But, the status when lamp is off or rated voltage is inputted/outputted)

2) Rated Output Power

NO	Items	CH1	CH2	Remarks
1	CHANNEL	+5V	+24.0V	
2	CONNECTOR PIN	CON 2 5V PIN : #5pin GND PIN: #6pin	CON 2 24V PIN: #2, #3, #4 GND PIN: #7pin	Jam cover switch included
3	Rated Output	+5V ± 5%(4.75 ~ 5.25V)	+24V -10%/+15%(21.6V ~ 27.6V)	
4	Max. Output current	0.8 A	2.5 A	
5	Peak Loading current	1.0 A	2.7 A	within 1ms Duration
6	RIPPLE NOISE Voltage	100mVp-p or less	500mVp-p or less	
7	Maximum output	2.5W	36W	
8	Peak output	4W	55.2W	1ms
9	Protection for loading shortage and overflowing current	Fuse Protection or Shutdown within 1.5A ~ 3.0A range.	Fuse Protection or Shutdown within 3.5A ~ 4.5A range.	

3) Consumption Power

NO	Item	CH1(+5V)	CH2(24V)	System
1	Stand-By	0.6 A	1.3 A	AVG : 70Wh
2	Printing	0.8 A	1.9 A	AVG : 400Wh
3	Sleep-Mode	0.5 A	0.3 A	AVG : 12Wh

4) Power Cord Length : 1830 ±50mm
5) Power Cord Switch : Exist
6) Feature
- Withstand Resistance : 100 MΩ or more (at DC 500V)
- Insulating revisiting pressure : Must be no problem within 1 min. (at1000Vac,10mA)
- Leaking Current : under 3.5mA
- Running Current : under 40A PEAK (AT 25 °C,COLDSTART)
under 50A PEAK (In other conditions)
- Rising Time : within 2Sec
- FallingTime : over 20ms
- Surge : Ring Wave 6KV-500A (Normal, Common)

7) Environment Condition
- Operating temperature range : 0 °C ~ 40 °C
- Maintaining temperature range : -20 °C ~ 40 °C
- Preserving Humidity Condition : 10% ~ 90% RH
- Operating atmospheric pressure range : 1atm

8) EMI Requirement : CISPR, FCC, CE, MIC,
9) Safety Requirement : IEC950 UL1950, CSA950, C-UL, Semko, EK, CB, CCC(CCIB),GOST, EPA,

2.2.6.2 HVPS Board

The HVPS board creates the high voltage of THV/MHV/Supply/Dev and supplies them to the developer part for making best quality printing image. The HVPS part takes the 24V and outputs the high voltage such as THV/MHV/Supply/Dev, and the outputted high voltage is supplied to the toner, OPC cartridge, and transfer roller.

(a) Transfer High Voltage (THV+)
- Input Voltage : 24 V DC +15% / -10% (21.6V~27.6V)
- Out Voltage : +1300KV ±1.5% (200MΩ Load)
- Out Voltage Trigger : 6.5 μA
- Input Voltage Variation : ±5 %
Load Variation : ±5 %
- Out Voltage Rising Time : 100 ms Max
- Out VoltageFalling Time : 100 ms Max
- Transfer Variation Voltage on Environment Variation : +500 V ~ +5000V
- Control Method on environment : THV-PWM ACTIVE, transfer Active signal, of environment sensing voltage is input and get feed back current, and recalculate it to resistance .
- Control method on transfer output voltage : It is controlled by changing its duty of THVPWM Signal as follows. 10% Duty : +500V, 90% Duty : +5000V

(b) Charge Voltage (MHV)
- Input Voltage : 24 V DC +15% / -10% (21.6V~27.6V)
- Out Voltage : -1300KV ±50V(50MΩ Load)
- Out Voltage Rising Time : 50 ms Max
- Out VoltageFalling Time : 50msMax
- Out Voltage Range : 30 MΩ ~ 1000MΩ
- Output Control Signal(MHV-PWM) : Active Low PWM signal for controlling MHV

(c)Developing Voltage (DEV)

- Input Voltage : 24V DC +15% / -10% (21.6V~27.6V)
- Output Voltage: -350V ± 20V (50 MΩLoad)
- Output Voltage Fluctuation range: PWM Control
- Input contrast of the output stability degree : ±5 %orless
- Loading contrast : ±5 %orless
- Output Voltage Rising Time : 50 ms Max
- Output Voltage Falling Time : 50 ms Max
- Output Loading range : 10MΩ~1000 MΩ
- Output Control Signal (BIAS-PWM) : Active Low PWM signal for controlling MHV

(d) Supply

- Output Voltage : -550V ± 50V(50MΩ Load)
- Input contrast of the output stability degree : under ±5 %
- Loading contrast : ±5 %orless
- Output Voltage Rising Time : 50 ms Max
- Output Voltage Falling Time : 50 ms Max
- Output Loading range : 10 MΩ ~ 1000 MΩ
- Output Control Signal (BIAS-PWM) : Active Low PWM signal for controlling MHV

2.2.7 FUSER AC POWER CONTROL

The Fuser(HEAT LAMP) gets heat from AC power. The AC power controls the switch with the Triac, a semiconductor switch. The 'ON/OFF control' is operated when the gate of the Triac is turned on/off by Phototriac (insulting part). In other words, the AC control part is passive circuit, so it turns the heater on/off with taking signal from engine control part.

When the 'HEATERON' signal is turned on at engine,the LED of PC102 (Photo Triac) takes the voltage and flashes. From the flashing light, the Triac part (light receiving part) takes the voltage,and the voltage is supplied to the gate of Triac and flows into the Triac. As a result, the AC current flows in the heat lamp, and heat is occurred.

On the other hand, when the signal is off, the PC102 is off, the voltage is cut off at the gate of Triac, the Triac becomes off, and then the heat lamp is turned off.

1) Triac feature : 16A, 600V SWITCHING

2) Phototriac Coupler (PC102)

- Turn OnIf Current : 15mA~50mA(Design : 16mA)
- High Repetive Peak Off State Voltage : Min 600V