24V, 2" HIGH SPEED THERMAL PRINTER

FTP-627 Series

■ OVERVIEW

The FTP-627 MCL Series consists of 24V drive ultra compact printers with 2 inch paper widths (58mm), which can print at high speed. Paper can be easily set by an unique platen release mechanism.

The FTP-627 MCL series can be used for a variety of applications, such as portable terminals, POS, ticket issuing terminals, label printers, and measurement and medical equipment.

■ HIGHLIGHTS

- **Ultra compact**
  Height 15.5 mm, width 69.6 mm, depth 34.3 mm (MCL002)

- **High speed printing**
  It can print at 60 mm/s (480 dotlines/s) maximum by using Fujitsu's unique head drive control.

- **With Auto Cutter**
  Two types of compact cutters, a full cut and a partial cut, are in series.

- **High resolution printing / Kanji supported**
  8 dots/mm of resolution printing is possible.

- **Easy paper setting**
  Our unique platen release mechanism allows a wide paper route even if the printer is ultra-compact, so paper can be easily inserted. Auto loading is also available on MCL001, MCL003 and MCL303 models.

- **Two types of paper routes**
  Front and bottom paper feed.

- **Easy mounting**
  Head, motor, sensor and other component wiring are unified to one flexible cable, and the mechanism can be secured by one hook and two screws at two locations, making mounting easy.

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■ PART NUMBERS

Item	Part Number
Printer mechanism	FTP-627MCL001 (front paper insertion without head open detection switch FTP-627MCL002 (bottom paper insertion without head open detection switch FTP-627MCL003 (front paper insertion with head open detection switch and knob) FTP-627MCL004 (bottom paper insertion with head open detection switch)
Mechanism with cutter	FTP-627MCL303 #01 MCL003 with full cut cutter FTP-627MCL303 #02 MCL003 with partial cut cutter
LSI for driving	FTP-627CU101
Interface Board — ANK only	FTP-627DSL011 (RS232C serial) FTP-627DCL011 (Centronics)
Interface Board — Kanji supported	FTP-627DSL112 (RS232C serial with flash), FTP-627DCL111(Centronics)

■ SPECIFICATIONS

Item	Specifications
Part number	FTP-627MCL001/002/003/004/303#01/303#02
Printing method	Thermal-line dot method
Dot structure	384 dots/line
Dot pitch (Horizontal)	0.125 mm (8 dots/mm)—Dot density
Dot pitch (Vertical)	0.125 mm (8 dots/mm)—Line feed pitch
Effective printing area	48 mm
Number of columns	ANK 32 columns/line (maximum 12x 24 dot font)
Paper width	58 mm $^{+0}_{-1}$
Paper thickness	60 to 80 μ m (some paper in this range may not be used because of paper characteristics)
Printing Speed	Maximum 60mm/sec. (480 dot line/sec.)
Character types	Alphanumeric, katakana: 159 types International and special characters: 195 types JIS Kanji level 1, level 2, non-Kanji (supported only by FTP-627DSL112, DCL111): about 6800 types
Character, dimensions (H×W), number of columns	12 × 24 dots, (1.5 × 3.0 mm), 32 columns: alphanumeric, katakana 24 × 24 dots, (3.0 × 3.0 mm), 16 columns: alphanumeric, katakana, Kanji 8 × 16 dots, (1.0 × 2.0 mm), 48 columns: alphanumeric, katakana 16 × 16 dots, (2.0 × 2.0 mm), 24 columns: alphanumeric, katakana, Kanji

■ SPECIFICATIONS

Item		Specification
Interface		Conforms to RS232C / Centronics
Power supply	For print head	24 VDC ±5% average current, current approx. 1.1A (25 ° C, Rav=1500) 24V, simultaneously ON, 64 dots)
	For motor of printer	24 VDC ±5%, 1A maximum
	For motor of cutter	24 VDC ±5%, 1 A maximum
	For logic	5 VDC ± 5%, 0.2 A maximum
Dimensions	Printer mechanism	83.5 x 35.7 x 15.5 mm (WxDxH), MCL003 (lever excluded)
	Mechanism with cutter	83.5 x 43.0 x 26.4mm (WxDxH), (screws and cables are excluded)
	Interface board	131 x 89 x 24 mm
Weight	Printer mechanism without cutter	Approximately 55g
	Printer mechanism with cutter	Approximately 120g
Life	Head	Pulse resistance: 100 million pulses/dot (under our standard conditions). Abrasion resistance: paper traveling distance 50km (print ratio: 25% or less)
	Cutter	300,000 minimum
Operating environment	Operating temperature	+5° C to +40° C (printing density assurance range, operation is possible at 0° C to +40° C)
	Operating humidity	20 to 85% RH (no condensation)
	Storage temperature	-20° C to +60° C (paper not included)
	Storage humidity	5-95% RH (no condensation)
Detection function	Head temperature detection	Detected by thermistor
	Paper out/mark detection	Detected by photo-interrupter
	Head up detection	Detected by slide-switch (003/004/303#1/303#2 only)
Recommended thermal sensitive paper		High sensitive paper: TF50KS-E4 (Nippon Paper)
		Standard paper: F60KS-E (Nippon Paper) FTP-020PU001, FTP-020P0104 (58mm) PD150R (Oji Paper) FTP-020P0701(58mm)
		Medium life storage paper: TF60KS-F1 (Nippon Paper) FTP-P0102 (58mm) PD170R (Oji Paper) P220VBB-1 (Mitsubishi Paper)
		Long life storage paper: PD60R-N (Oji Paper) AFP-235 (Mitsubishi Paper) TP50KJ-R (Nippon Paper) HA220AA (Mitsubishi Paper)

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■ FUNCTION

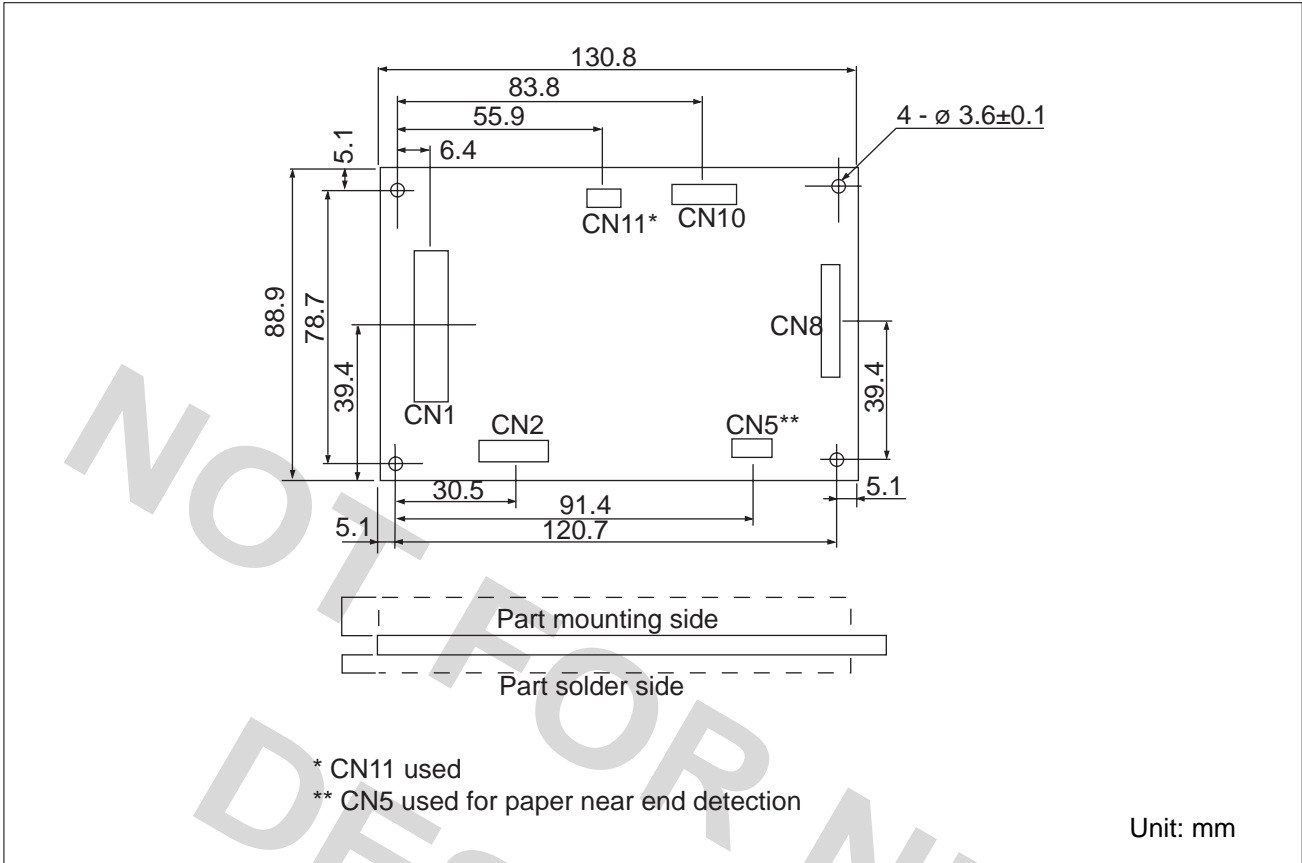|	Item		Item
1.	Test print function	8.	Cutter abnormality detection
2.	Paper out detection	9.	Motor power saving function
3.	Paper near end detection	10.	Mark detection function
4.	Head up detection	11.	MCU operation abnormality detection
5.	Thermal head temperature abnormality detection	12.	Power ON/OFF sequence protection
6.	Blow-out fuse detection	13.	Motor over-current protection
7.	Head voltage abnormality detection	14.	Hardware timer

■ DIMENSIONS

1. Printer mechanism

Unit: mm

2. Interface board

130.8
83.8
55.9
6.4
5.1
4 - ø 3.6±0.1
CN11* CN10
88.9
78.7
CN8
39.4
39.4
CN1
CN2
CN5**
30.5
91.4
120.7
5.1
5.1

Part mounting side

Part solder side

* CN11 used
** CN5 used for paper near end detection

Unit: mm

■ PRINTER CONNECTOR (CN8) (FLEXIBLE PT BOARD) PIN ARRAYS

Control circuit side connector: 52030-3010 Molex or equivalent product

No.	Signal	I/O	Contents	No.	Signal	I/O	Contents
1	PHK	—	Photo interrupter (cathode)	2	$\overline{VSEN}$	I	Power supply for paper sensor
3	PHE	O	Photo interrupter (emitter)	4	VH	I	Head driving power supply
5	VH	I	Head driving power supply	6	GNC	—	Ground for head
7	GND	—	Ground for head	8	DIN	I	Data input
9	$\overline{LAT}$	I	Data latch	10	CLK	I	Clock
11	$\overline{STB6}$	I	Enable 6	12	$\overline{STB5}$	I	Enable 5
13	$\overline{STB4}$	I	Enable 4	14	VDD	I	Logic Power supply
15	$\overline{STB3}$	I	Enable 3	16	$\overline{STB 2}$	I	Enable 2
17	$\overline{STB1}$	I	Enable 1	18	TH	O	Thermistor
19	TH	O	Thermistor	20	GND	—	Ground for head
21	GND	—	Ground for head	22	VH	I	Head driving power supply
23	VH	I	Head driving power supply	24	N.C.	—	Open terminal
25	SW1	I	Head open switch*	26	SW2	O	Head open switch*
27	$MT/\overline{B}$	I	Stepping motor coil excitation signal B	28	MT/B	I	Stepping motor coil excitation signal B
29	$MT/\overline{A}$	I	Stepping motor coil excitation signal A	30	MT/A	I	Stepping motor coil excitation signal A

* on MCL003 / MCL004/ MCL303#01 and MCL303#02 models

■ INTERFACE

1. Centronics interface

(1) Connector (CN1)

Connector part number   : FCN-605Q030-G/S (Fujitsu Components) or equivalent

Mating connector part number : FCN-607B030-G/D (Fujitsu Components) or equivalent

(2) Connector pin assignment

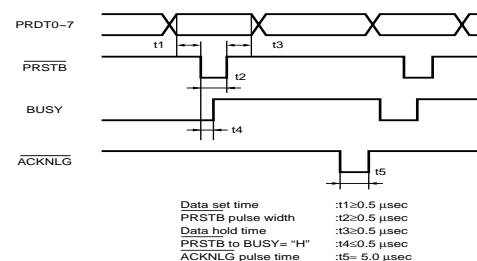| No.	Signal	I/O	Contents	No.	Signal	I/O	Contents
1	$\overline{\text{PRSTB}}$	I	Data strobe	2	$\overline{\text{PRSTB}}$-RET	—	Connected to logic GND
3	PRDT0	I	Data 0	4	PRDT0-RET	—	Connected to logic GND
5	PRDT1	I	Data 1	6	PRDT1-RET	—	Connected to logic GND
7	PRDT2	I	Data 2	8	PRDT2-RET	—	Connected to logic GND
9	PRDT3	I	Data 3	10	PRDT3-RET	—	Connected to logic GND
11	PRDT4	I	Data 4	12	PRDT4-RET	—	Connected to logic GND
13	PRDT5	I	Data 5	14	PRDT5-RET	—	Connected to logic GND
15	PRDT6	I	Data 6	16	PRDT6-RET	—	Connected to logic GND
17	PRDT7	I	Data 7	18	PRDT7-RET	—	Connected to logic GND
19	$\overline{\text{ACKNLG}}$	O	Data input acknowledge	20	$\overline{\text{ACKNLG}}$-RET	—	Connected to logic GND
21	BUSY	O	Busy	22	BUSY-RET	—	Connected to logic GND
23	RINF2	O	Printer status 2	24	$\overline{\text{INPRM}}$-RET	—	Connected to logic GND
25	$\overline{\text{SLCTIN}}$	I	Printer select	26	$\overline{\text{INPRM}}$	I	Reset
27	RINF1	O	Printer status 1	28	RINF3	O	Printer status 3
29	$\overline{\text{ATF}}$	I	Paper feed request	30	GND	—	Logic GND

Notes:

- Symbol "——" means a negative logic signal.
- "–RET" signal is a return signal of the twisted pair cable.
- "I" or "O" means a signal direction from the interface board side.

(3) Connector pin number

FCN-605Q030-G/S(Fujitsu Components)

(4) Data input signal timing

Data set time	:t1≥0.5 μsec
$\overline{\text{PRSTB}}$ pulse width	:t2≥0.5 μsec
Data hold time	:t3≥0.5 μsec
$\overline{\text{PRSTB}}$ to BUSY= "H"	:t4≤0.5 μsec
$\overline{\text{ACKNLG}}$ pulse time	:t5= 5.0 μsec

(5) Printer status signals

	Error status	RINF1	RINF2	RINF3
1.	Paper out	Low	High	Low
2.	Paper near end	High	High	Low
3.	Head up	High	Low	Low
4.	Head temperature abnormality	High	Low	High
5.	Head voltage abnormality	Low	High	High
6.	Hardware abnormality	High	High	High
7.	Mark detection abnormality	Low	Low	Low
8.	Normal	Low	Low	High

2. RS-232C

(1) Connector (CN2)

Connector part number : B6B-XH-A (J.S.T.) or equivalent
Mating connector part number : XHP-6 (J.S.T.) or equivalent

(2) Connector pin assignment

No.	Signal	I/O	Contents No.	No.	Signal	I/O	Contents No.
1	FG	-	Frame ground	2	RD	I	Receive data
3	TD	O	Transmission data	4	DTR	O	Data terminal ready
5	GND	-	Signal ground	6	DSR	I	Data set ready
7	SLCTIN	I	Printer select	8	INPRM	I	Reset
9	ATF	I	Paper feed request	10	PWD	I	Power down cancellation signal

Notes:
- Symbol "——" means a negative logic signal.
- "I" or "O" means a signal direction from the interface board side.

Cutter (CN11)

■ CONNECTOR PIN ASSIGNMENT

1. Connector for power supply (CN10)

Part number : B6B-VH White (J.S.T) or equivalent (board side)
Mating connector part number: VHR-6 (J.S.T.) or equivalent

2. Connector for printer mechanism connection (CN8)

Part number : 52030-3010 (made by Molex) or equivalent (board side)

No.	Signal	I/O	Contents	No.	Signal	I/O	Contents
1	PHK	—	Photo interrupter (cathode)	2	VSEN	O	Power supply for paper senor
3	PHE	I	Photo interrupter (emitter)	4	VH	O	Head driving power supply
5	VH	O	Head driving power supply	6	GNC	—	Ground for head
7	GND	—	Ground for head	8	DIN	O	Data input
9	LAT	O	Data latch	10	CLK	O	Clock
11	STB6	O	Enable 6	12	STB5	O	Enable 5
13	STB4	O	Enable 4	14	VDD	O	Logic Power supply
15	STB3	O	Enable 3	16	STB 2	O	Enable 2
17	STB1	O	Enable 1	18	TH	I	Thermistor
19	TH	I	Thermistor	20	GND	—	Ground for head
21	GND	—	Ground for head	22	VH	O	Head driving power supply
23	VH	O	Head driving power supply	24	N.C.	—	Open terminal
25	SW1	O	Head open switch*	26	SW2	I	Head open switch*
27	MT/B	O	Stepping motor coil excitation signal B	28	MT/B	O	Stepping motor coil excitation signal B
29	MT/A	O	Stepping motor coil excitation signal A	30	MT/A	O	Stepping motor coil excitation signal A

* on MCL003 / MCL004/ MCL303#01 and MCL303#02 models

■ **OPTIONS**

Name		Part Number	Length (mm)
Interface Cable (between board and equipment)	For Centronics (CN1)	FTP-622Y201	500
	For RS232C (CN2)	FTP-622Y301	300
Power supply cable (CN10)		FTP-622Y401	300
Near end paper sensor (CN5) if required		FTP-	

■ COMMANDS

Command	Contents
HT	Moves print position to the next tab.
LF	Line feed.
FF	Feeds forms (new page).
ECS RS	Sets reverse printing.
ESC US	Resets reverse printing.
ESC ! + n	Sets print mode.
ESC %+n	Download character set specification//cancellation.
ESC &+y+c_1+c_2+x+d_1~d_N	Download character definition.
ESC *+m+n_1+n_2+d_1~d_N	Sets bit image mode.
ESC ?+n	External registration character deletion.
ESC 2	Sets 1/6 inch line feed length.
ESC 3+n	Sets the line feed length.
ESC @	Printer initialization.
ESC A+n	Sets the space between the line.
ESC C+n	Sets the page length by character line.
ESC D+d_1~d_N+NUL	Sets the tab position.
ESC J+n	Feeds paper in forward direction and prints.
ESC K+n	Reverse paper feed.
ESC R+n	Selects international character.
ESC c+1+n	Sets internal processing (including auto paper loading).
ESC d+n	Printing and n-line feeding.
ESC e+n	Prints and reverse feeds n-lines.
ECS s+n	Sets printing speed.
ECS t+n	Character code table selection.
ESC {+n	Sets/resets upside down printing.
FS !+n	Kanji printing mode collective specification.
FS &	Kanji printing mode specification.
FS .	Kanji printing mode cancellation.
FS 9+n	Sets the detection functions.

Commands continued

Command	Contents
FS C+n	Kanji code system selection.
FS W+n	Kanji double height and width mode specification/cancellation.
GS <	Line feeds to the next mark.
GS A+m+n	Sets the line feed length after mark detection.
GS E+n	Sets print quality.
GS V+n+m	Paper cutting.
GS e+n+m	Sets bar code width.
GS h+n	Sets bar code height.
GS k+m+n+d$_1$~d$_N$	Selects bar code type and prints.
GS w+n	Sets bar code width magnification.
FS *+m+n$_1$+n$_2$+d$_1$~d$_N$	High speed collective image printing specified.
GS &+m+x+y$_1$+y$_2$+d$_1$~d$_N$	Registration of image data.
GS '+m+n	Prints registered image data.
FS E+n	Correction of impressed energy.
ESC V+n	Right Rotation 90° specification / cancellation.
GS a+n	Sets and cancels status transmission. (Serial Mode)
FS r+n	Parameter transmission. (Serial Mode)
ESC EM+n	Setting the amount of the feeding at automatic paper load.
ESC X+n+m	Setting the turning time of the motor excitation.
ESC DEL+n	Deletes recorded contents in flash memory.

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