Thermal Printer Mechanism

E245SG Series

Factory will execute the PCN procedure before change any specifications or materials related to this mechanism. There will be no changes before the acknowledge and confirmation of our client.

The latest version of the specification will be sent to the client for confirmation if any change has been agreed.

Factory continuously promotes new products and we also provide ODM service, if there is any need, please contact us at anytime.

REVISION RECORDS

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
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CHAPTER 1 CHARACTERS AND OPERATING PRECAUTIONS

1.1 Characters

- **Operating voltage range**

The range of operating voltage is 4.75～9.5V and the range of logic voltage is 2.7～5.5V.

- **Low volume compact and light**

The mechanism is compact and light.

Dimensions: 83.1mm(width)* 43.9mm(depth)* 27.4mm(height).

- **High resolution printing**

A high-density printer head of 8 dots/mm make the printing clear and precise.

- **Printing speed adjustable***

According to driving power and sensitivity of thermal paper, set different printing speed required. The max speed is 100mm/sec.

- **Easy paper loading**

Detachable rubber roller structure makes the paper loading easier.

- **Low noise**

Thermal line dot printing is used to guarantee low-noise printing.

*Remark: Print speed differs depending on working conditions.

1.2 Operation Precautions

1) TPH and photo interrupter is sensitive to static electricity,in order to prevent damages of inner parts of the printer caused by the static electricity,When handling this printer,please take any preventive measures against static electricity, such as disposable static wrist strap.

2) Pay attention not to flaw or damage or smear the rubber part of the platen,the platen gear,and the bearing part(particularly,don't attach any oil or grease and foreign materials on the rubber part).

3) Never attempt to touch the thermal printer head surface with bare hands. Attaching any oil or grease such as oils from palms on the heating element part of may be shortening the lifetime of the thermal head. In case that any oil and grease or foreign materials are attached on it. Perform the cleaning immediately.In addition, pay attention not to hit it with something hard such as driver.

4) The thermal head and FFC are shipped as they are connected. When installing the printer, do not pull or apply any extra force in order to avoid the connected part of the thermal head and FFC from being disconnected or deviated. When connecting FFC, please make it sure under condition that the power of control circuit is off. Plug in / out FFC to control board, should less than 10 times, meanwhile make FFC parallel to connector socket.

5) Do not make FFC bend because it may cause FFC disconnection or broken. If FFC requires to be bent, the bending should be more than R1,and do not rework (straighten or bend backward).

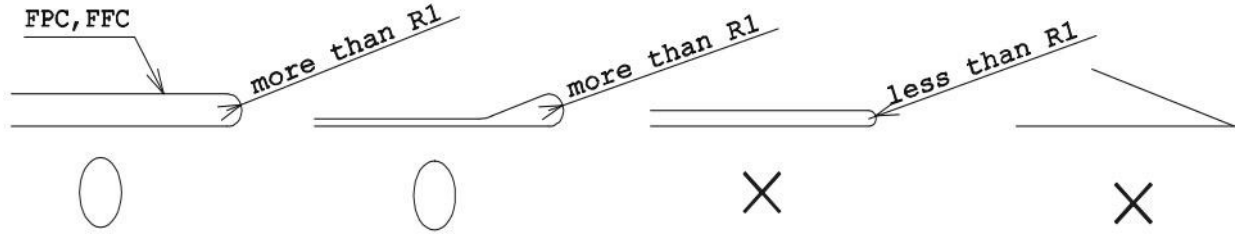

Figure 1-1 FFC illustration

6) If any voltage is applied to the thermal head when the head or paper is wet due to condensation, it may be damaged by electrolytic corrosion; therefore, when using the printer, pay attention to
the following items.

- ❖ Do not apply any electric power to the printer when it is not used.
- ❖ Do not perform the printing with any wet paper.
- ❖ Do not apply any electric power to the printer under any environment where any dew condensation is possible to occur.
- ❖ Turn off all electric power to the head immediately when condensation occurs. Use the head only after the head is completely dried.
- ❖ Depending on the environment where the printer is used (the low temperature or high humidity), condensation may be caused by water vapor generated from the used paper when performing the printing of the high printing rate (solid fills, zigzag printing); therefore, the environment should be considerably evaluated.

7) When using this mechanism for the continuous actions, the temperature of the head (the temperature detected with the thermistor) should be equal or less than 75 degrees.

8) Keep the paper conveyance unobstructed.

9) Do not attempt to pull any paper ejected from the printer.

10) Use the high quality thermal paper, for the property of the paper have big effect on printing quality. The perforated paper may cause the damage to the thermal heads and even shorten lifetime.

CHAPTER 2 SPECIFICATIONS

2.1 General Specifications

Item		Specification
		E245SG
Printing Method		Thermal dot line printing
Total dots per line		384 dots
Simultaneously activated dots (max.)		192 dots
Resolution		8 dots/mm
Paper feed pitch		0.03125mm
Maximum print speed*		100 mm/s
Print width		48 mm
Paper width		57.5±0.5 mm
Thermal head temperature detection		Via thermistor
Platen position detection		Via mechanical switch
Out-of-paper detection		Via reflection type photo interrupter
Cutter home position detection		Via transmission type photo interrupter
W*D*H (mm)		83.1mm ×43.9mm ×27.4mm
Weight		Approx.144.2g
Specified thermal paper		Oji Paper PD160R
Specified platen		Manual knob
Life span (at 25℃ and rated energy)	Activation pulse resistance	100 million pulses or more
	Abrasion resistance	100 km or more
Cutter	Paper cutting resistance	0.5 million cuts or more
	Minimum paper cutting length	10 mm
	Cutting processing time	Approx.1.0s/cycle
	Cutting frequency	1 cut/2s max.
	Cutting type	Full cut
Operating temperature range (℃)		-10～+50 (Non condensing)
Operating humidity range (RH)		20％～85％
Storage temperature range (℃)		-20～＋60 (Non condensing)
Storage humidity range (RH)		10%～90%

NOTE:

Pls. use the recommended thermal paper or same quality paper, otherwise it will influence the printing quality and decrease the thermal printer head life.

Print speed changes according to the processing speed of controller and the pulse width.

2.2 Heat Element Dimensions

E245SG contains a thermal head with 384 heat elements.

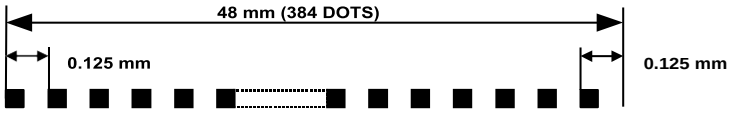

Figure 2-1 Heat Element Dimensions

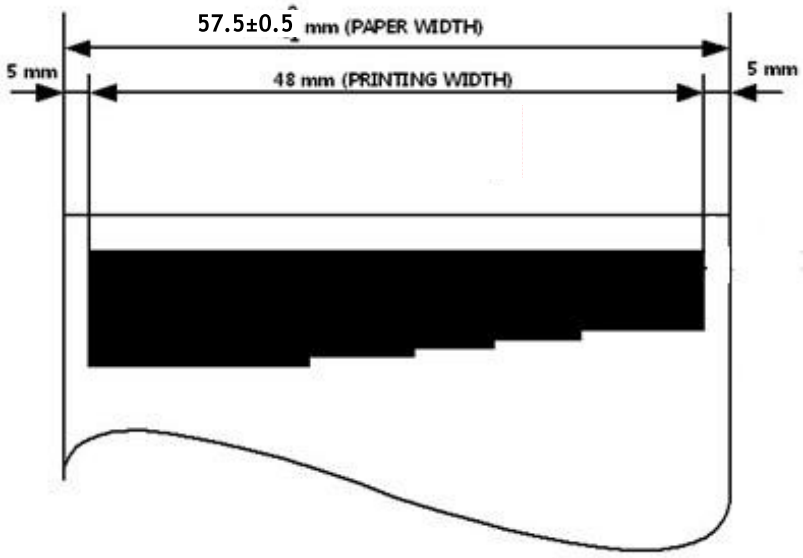

Figure 2-2 Print Area

2.3 Step Motor Characteristics

2.3.1 Paper Feed Motor

(1) Specification

Item	Specification
Type	PM
Number of phases	2-phase
Excitation	1-2 phase
Winding resistance per phase	12 Ω ±10 %
Drive voltage	4.75～9.5 V
Drive current	260mA/phase
Drive frequency	3200 pps max.

(2) Excitation Sequence

Signal Name	Sequence							
	STEP1	STEP2	STEP3	STEP4	STEP5	STEP6	STEP7	STEP8
A	HIGH	HIGH	OPEN	LOW	LOW	LOW	OPEN	HIGH
$\overline{A}$	LOW	LOW	OPEN	HIGH	HIGH	HIGH	OPEN	LOW
B	OPEN	HIGH	HIGH	HIGH	OPEN	LOW	LOW	LOW
$\overline{B}$	OPEN	LOW	LOW	LOW	OPEN	HIGH	HIGH	HIGH

(3) Accelerate Time Table

STEP	Time (μs)	STEP	Time (μs)
Start	5000	37	440
1	3707	38	434
2	2291	39	428
3	1769	40	422
4	1485	41	417
5	1302	42	412
6	1172	43	407
7	1074	44	402
8	996	45	398
9	933	46	393
10	880	47	389
11	836	48	385
12	797	49	381
13	763	50	377
14	733	51	373
15	707	52	369
16	683	53	365
17	661	54	362
18	641	55	359
19	623	56	355
20	606	57	352
21	591	58	349
22	577	59	346
23	563	60	343
24	551	61	340
25	539	62	337
26	528	63	335
27	518	64	332
28	508	65	329
29	499	66	327
30	490	67	324
31	482	68	322
32	474	69	319
33	467	70	317
34	459	71	315
35	453	72	313
36	446		

Object thermal paper:
The paper with thickness of 80μm or thicker (TL69KS-LH)

STEP	Time (μs)	STEP	Time (μs)	STEP	Time (μs)	STEP	Time (μs)
Start	5000	31	625	62	437	93	356
1	4805	32	615	63	434	94	354
2	2970	33	605	64	430	95	352
3	2293	34	596	65	427	96	350
4	1925	35	587	66	423	97	348
5	1688	36	578	67	420	98	346
6	1519	37	570	68	417	99	345
7	1392	38	562	69	414	100	343
8	1291	39	555	70	411	101	341
9	1209	40	548	71	408	102	339
10	1141	41	541	72	405	103	338
11	1083	42	534	73	402	104	336
12	1033	43	528	74	399	105	334
13	989	44	521	75	397	106	333
14	951	45	515	76	394	107	331
15	916	46	510	77	391	108	330
16	885	47	504	78	389	109	328
17	857	48	499	79	386	110	327
18	831	49	493	80	384	111	325
19	808	50	488	81	382	112	324
20	786	51	483	82	379	113	322
21	766	52	478	83	377	114	321
22	748	53	474	84	375	115	319
23	730	54	469	85	372	116	318
24	714	55	465	86	370	117	317
25	699	56	461	87	368	118	315
26	685	57	456	88	366	119	314
27	671	58	452	89	364	120	313
28	659	59	448	90	362		
29	647	60	445	91	360		
30	636	61	441	92	358		

2.3.2 Cutter Motor

(1) Specification

Item	Specification
Type	PM
Number of phases	2-phase
Excitation	1-2 phase
Winding resistance per phase	12 Ω ±10 %
Drive voltage	4.75～9.5 V
Drive current	350mA/phase
Drive frequency	1255pps max.(outward) 2242pps max.(homeward)

(2) Excitation Sequence

Signal Name	Sequence							
	STEP1	STEP2	STEP3	STEP4	STEP5	STEP6	STEP7	STEP8
A	OPEN	LOW	LOW	LOW	OPEN	HIGH	HIGH	HIGH
$\overline{A}$	OPEN	HIGH	HIGH	HIGH	OPEN	LOW	LOW	LOW
B	LOW	LOW	OPEN	HIGH	HIGH	HIGH	OPEN	LOW
$\overline{B}$	HIGH	HIGH	OPEN	LOW	LOW	LOW	OPEN	HIGH

(3) Accelerate Time Table

STEP	Time (μs)	STEP	Time (μs)
Start	5000	37	440
1	3707	38	434
2	2291	39	428
3	1769	40	422
4	1485	41	417
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12	797	49	381
13	763	50	377
14	733	51	373
15	707	52	369
16	683	53	365
17	661	54	362
18	641	55	359
19	623	56	355
20	606	57	352
21	591	58	349
22	577	59	346
23	563	60	343
24	551	61	340
25	539	62	337
26	528	63	335
27	518	64	332
28	508	65	329
29	499	66	327
30	490	67	324
31	482	68	322
32	474	69	319
33	467	70	317
34	459	71	315
35	453	72	313
36	446		

2.4 Thermal Head Specifications

2.4.1 General Characteristics

Item	Specification	Note
Print width	48 mm	
Number of heater elements	384 dots	
Heater resolution	8 dots/mm	203dpi
Heater elements pitch	0.125 mm	
Heater resistance	$\overline{R}$ = 176 Ω ±3%	
Number of data inputs	1 serial input	Data In
Logic signals	6 $\overline{STROBE}$ and 1 $\overline{LATCH}$	
Logic power supply	5.0V × 60 mA	At 8 MHz
Heating voltage	8.5 V	
Specification for Thermistor	R_{25}=30KΩ±5%,B=3,950K±3%	See 2.4.8

2.4.2 Maximum Parameter

Parameter	Symbol	Specification		Note
Heater energy consumption	Eo max	2.50ms/line	1.25ms/line	Ta=25℃
		0.44mJ/dot	0.27mJ/dot	
Head voltage	VH max	10.0 V		TPH Connectors
Logic voltage	VDD max	5.5 V		
Number of heating dots simultaneously ON	Ndot max	192 dots		
Operating temperature*	Ta	-5 ℃ ～ +50 ℃		Non-condensing
Storage temperature		-40 ℃ ～ +80 ℃		
Operating humidity *		10～90%RH		Non-condensing
Storage humidity		5～90 %RH		
Maximum operating temperature	Ts	Peak 75℃ Thermistor temp.		Printing must be stopped, and wait until 60℃

NOTE: On the above conditions,TPH can't ensure the printing quality and life.

*: In the temperature which is out of range(+5℃~+40℃),it will influence the printing quality.

2.4.3 Characteristics Recommended

Item		Symbol	Recommended conditions		Note
Print Speed			2.5 ms/line	1.25 ms/line	
Heater power consumption		Po	0.238 W/dot	0.336 W/dot	$\overline{R}$=176Ω
Heat voltage		VH	7.2 V	8.5 V	TPH Connectors
Heater energy consumption	5℃	Eo (ts)	0.29 mJ/dot(1.22 ms)	0.20 mJ/dot(0.60 ms)	$\overline{R}$=176Ω See 2.4.7
	25℃		0.27 mJ/dot(1.14 ms)	0.18 mJ/dot(0.54 ms)	
	40℃		0.25 mJ/dot(1.05 ms)	0.16 mJ/dot(0.48 ms)	
Supply current		Io	36.8 mA/dot	43.7 mA/dot	

2.4.4 Electrical Characteristics

1) Limited parameter

Item	Symbol	Text condition	Rated value	Unit
Supply voltage	VDD	Surge	0～7	V
	VH	Surge	0～10	V
Logic input voltage	V_{IN}		0～VDD+0.5	V
Drive supply current	I_h		70	mA

2) Recommended parameter

Item	Symbol	Text condition	Reference			Unit
			Min.	Typ.	Max.	
Supply voltage	VDD		2.7	5.0	5.5	V
	VH		—	—	8.5	V
Logic input voltage	V_{IH}		0.8*VDD	—	VDD	V
	V_{IL}		0	—	0.2*VDD	V
Clock frequency	f_{clk}	Duty 50%	—	—	10	MHz

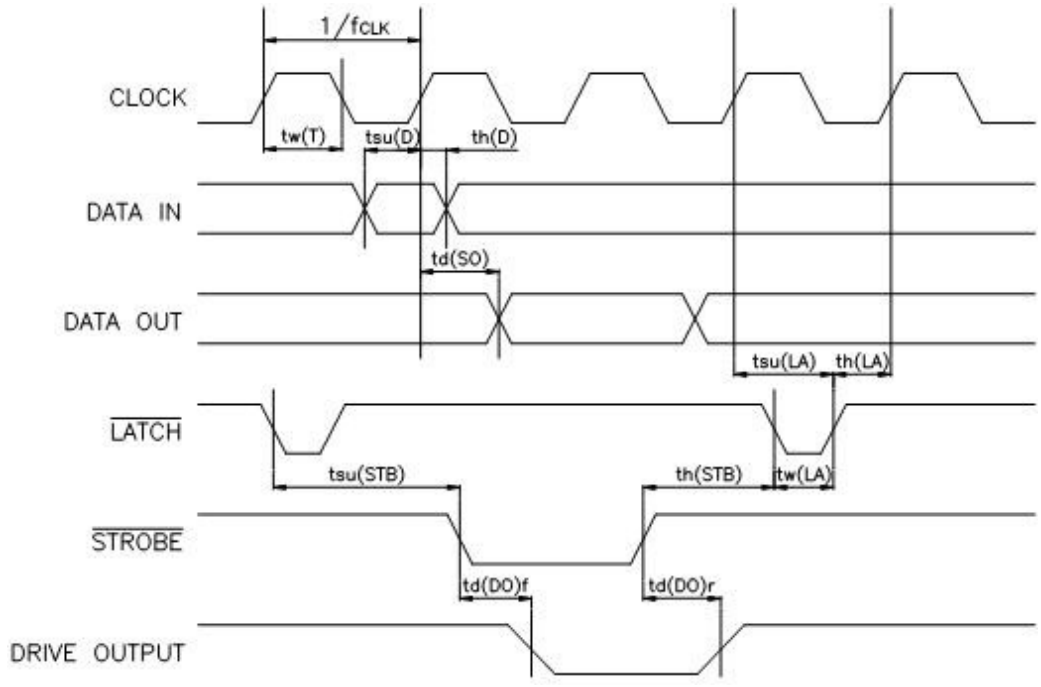
3) Electrical characteristics

Item		Symbol	Test conditions	Min.	Typ.	Max.	Unit
Logic input current	$\overline{LATCH}$	I_{IH}	V_{IH}=VDD	—	—	3.0	μA
	$\overline{STROBE}$			—	—	50	
	CLOCK			—	—	3.0	
	DATA IN			—	—	0.5	
	$\overline{LATCH}$	I_{IL}	V_{IL}=GND	-330	—	—	μA
	$\overline{STROBE}$			-0.5	—	—	
	CLOCK			-3.0	—	—	
	DATA IN			-0.5	—	—	
Drive output voltage(Low)		V_{DOL}	VDD=3V I_{DOL}=60mA	—	0.7	0.9	V
Drive Leak current		I_{LEAK}	V_{DOH}=8V	—	—	1.0	μA/dot
Logic supply current		IDD	f_{CLK}=8MHz DI=1/2f_{CLK}	—	21	60	mA
Logic supply current (Non-Operation)		I_S	DATA IN/CLOCK = GND Other logic signal open	—	—	150	μA

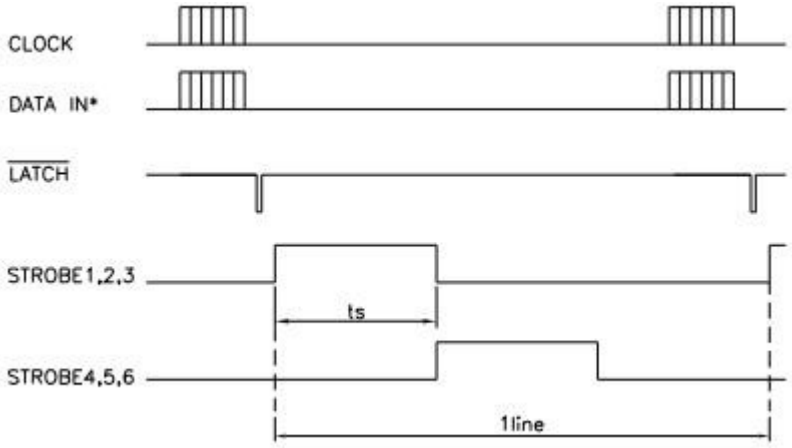
Note: $\overline{STROBE}$ includes pull-down resistance of 300KΩ±50% per IC.

2.4.5 Timing Characteristics

Parameter	Symbol	Ratings			unit
		Min.	Typ.	Max.	
Clock frequency	f_{CLK}			10	MHZ
Clock pulse width	$t_w(T)$	40			ns
Data setup time	$t_{su}(D)$	40			ns
Data hold time	$t_h(D)$	40			ns
Latch setup time	$t_{su}(LA)$	100			ns
Latch pulse width	$t_w(LA)$	100			ns
Latch to Strobe setup time	$t_{su}(STB)$	100			ns
Strobe to Latch setup time	$t_h(STB)$	15			µs
Clock to Data out delay time	$t_d(SO)$			50	ns
Strobe to driver Output delay time	$t_d(DO)r$			13.0	µs
	$t_d(DO)f$			13.0	µs



2.4.6 Timing Chart



*: While printing, data transmission is possible.

2.4.7 Equation

Calculate the printing energy using this equation:

$$E_O = I_o^2 \overline{R} t_s = \frac{(VH - V_{com})^2 \cdot \overline{R} \cdot t_s}{(\overline{R} + R_{ic})^2}$$

$R_{ic} = 11.7\,\Omega$: Driver IC "ON" resistance

t_s : Strobe pulse width

VH : Head voltage

$\overline{R}$: Heater average resistance

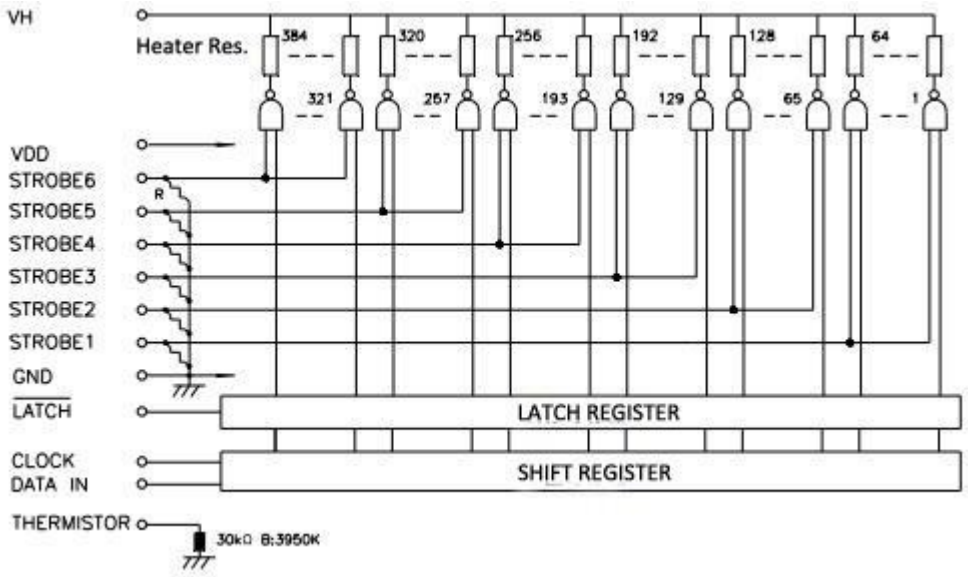
$V_{com} = 0.5$ V

2.4.8 Thermistor Resistance

R_{25} = 30KΩ±5%, B $_{CONST}$= 3950kelvin±3%, $R = R_{25}e^{B(1/T-1/T_{25})}$

Temperature (℃)	Thermistor Resistance(R)		
	Min.(KΩ)	Typ.(KΩ)	Max.(KΩ)
-40	717	843	989
-35	535	623	723
-30	405	466	535
-25	308	352	400
-20	238	269	303
-15	185	208	232
-10	145	161	178
-5	113	124	137
0	88.7	96.8	105
5	69.9	75.7	81.7
10	55.4	59.5	63.8
15	44.1	47.1	50.1
20	35.4	37.5	39.6
25	28.5	30	31.5
30	22.8	24.2	25.5
35	18.3	19.6	20.8
40	14.9	15.9	17.1
45	12.1	13.1	14.1
50	9.92	10.8	11.7
55	8.16	8.91	9.7
60	6.76	7.41	8.12
65	5.62	6.2	6.83
70	4.7	5.21	5.77
75	3.95	4.4	4.9
80	3.34	3.74	4.18

2.4.9 Structure Figure



STROBE No.	Dot No.	Number of Dots
1	1～64	64
2	65～128	64
3	129～192	64
4	193～256	64
5	257～320	64
6	321～384	64

2.4.10 Operating Precautions

In order to prevent the printer head heater element overheating or burned up, when we designing products, pay attention to the points as follows:

- **In hardware terms:**
  1) When the power on, the order should be VDD→VH.
  2) When the power is on or stand by, make sure that the STROBE signal is in invalid state.
  3) Make sure if program is abnormal (such as system halted), VH voltage should be shut off automatically.
  4) During the printing, Detecting thermistor temperature, make sure that the thermal printer head (TPH) is not overheated.

- **In firmware terms:**
  1) STROBE time should not be too long.
  2) In the following two cases, do not start:
  ① when paper jammed; ② When the paper is out.
  3) When the power is on or each printing task completed, it is recommended to send blank data to the mechanism, so it can prevent the printer head from damaged if there are some hardware failure on the control board.
  4) Over-temperature protection: The printer stops working when heating temperature is greater than 75℃, and start working again when the temperature down to 60℃.

2.5 Pin Assignment

2.5.1 Mechanism Main FPC Pin Assignment

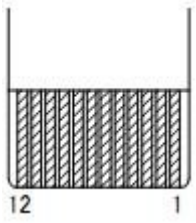
Type: FPC / 50PIN / 0.5MM / DUAL ROW STRAIGHT / 180° SINGLE CONTACT/ SMD / LATCH (1/2)

Pin No.	Signal Name	Description
1	VH	Thermal head drive power supply
2	VH	Thermal head drive power supply
3	VH	Thermal head drive power supply
4	VH	Thermal head drive power supply
5	VH	Thermal head drive power supply
6	VH	Thermal head drive power supply
7	DI	Print data input (serial input)
8	CLK	Synchronizing signal for print data transfer
9	GND	GND
10	GND	GND
11	GND	GND
12	GND	GND
13	GND	GND
14	GND	GND
15	STROBE 6	Thermal head print activation instruction signal (#6block)
16	STROBE 5	Thermal head print activation instruction signal (#5 block)
17	STROBE 4	Thermal head print activation instruction signal (#4 block)
18	VDD	Logic power supply
19	GND	GND
20	GND	GND
21	TM1	Thermistor
22	STROBE 3	Thermal head print activation instruction signal (#3 block)
23	STROBE 2	Thermal head print activation instruction signal (#2 block)
24	STROBE 1	Thermal head print activation instruction signal (#1 block)
25	GND	GND
26	GND	GND
27	GND	GND

(2/2)

Pin No.	Signal Name	Description
28	GND	GND
29	GND	GND
30	GND	GND
31	$\overline{LATCH}$	Print data latch (memory storage) signal
32	VH	Thermal head drive power supply
33	VH	Thermal head drive power supply
34	VH	Thermal head drive power supply
35	VH	Thermal head drive power supply
36	VH	Thermal head drive power supply
37	VH	Thermal head drive power supply
38	NC	No connection
39	PS	Output signal of the out-of-paper sensor (Photo transistor collector) -
40	VPS	Power supply of the out-of-paper sensor (LED anode)
41	GND	GND of the out-of-paper sensor (LED cathode, photo- transistor emitter) Platen position sensor GND
42	HS	Platen position sensor output
43	NC	No connection
44	FG	FG
45	FG	FG
46	NC	No connection
47	$\overline{A}$	Printer drive motor drive signal
48	B	Printer drive motor drive signal
49	A	Printer drive motor drive signal
50	$\overline{B}$	Printer drive motor drive signal

2.5.2 Autocutter Connector Pin Assignment



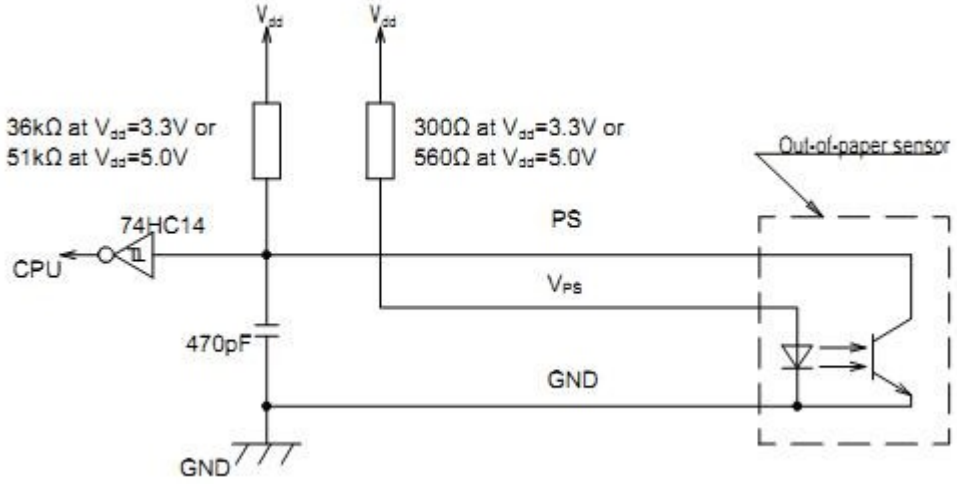
Type: FPC / 12PIN / 0.5MM / DUAL ROW STRAIGHT / 180° SINGLE CONTACT / SMD / LATCH

Pin No.	Signal name	Description
1	NC	No connection
2	VCS	Power supply of the cutter home position sensor (LED anode)
3	GND	GND of the cutter home position sensor (LED cathode, photo-transistor emitter)
4	CUTS	Output signal of the cutter home position sensor (Photo-transistor collector)
5	$\overline{B}$	Autocutter drive motor drive signal
6	$\overline{B}$	Autocutter drive motor drive signal
7	$\overline{A}$	Autocutter drive motor drive signal
8	$\overline{A}$	Autocutter drive motor drive signal
9	B	Autocutter drive motor drive signal
10	B	Autocutter drive motor drive signal
11	A	Autocutter drive motor drive signal
12	A	Autocutter drive motor drive signal

2.6 Sensor Specifications

2.6.1 Paper-out Detection Sensor

E245SG has a reflective sensor. As show in the figure below, when paper out, no infrared light will be reflected, the output is high. When everything is normal, the sensor will output low level. The circuit driver of photo detection as follows: The logic voltage could be 3.3V. When the paper out or platen released, do not start the printer.



Absolute Maximum Ratings (Ta=25℃)

Parameter		Symbol	Limits	Unit
Input(LED)	Forward current(Continuous)	I_F	20	mA
	Reverse voltage(Continuous)	V_R	6	V
	Power dissipation	P_D	45	mW
Output (Photo-transistor)	Collector-emitter voltage	V_{CEO}	16	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	I_C	10	mA
	Collector power dissipation	P_C	25	mW
Total power dissipation		Ptot	60	mW
Operating temperature		Topr	-30～+85	℃
Storage temperature		Tstg	-40～+100	℃
Reflow soldering temperature		Tsol	260	℃

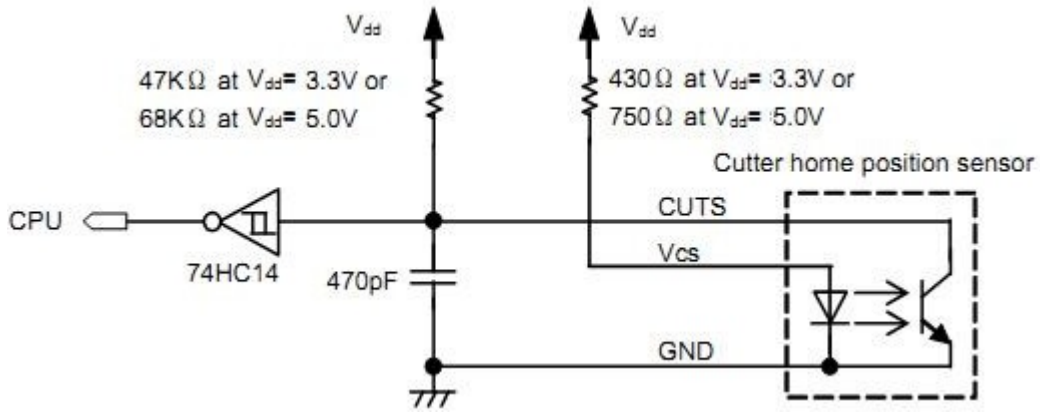
Electro-Optical Characteristics (Ta=25℃)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Emitter	Forward voltage	V_F	0.9	--	1.3	V	I_F=4mA
	Reverse current	I_R	---	---	10	μA	V_R=6V
	Capacitance	C_t	---	25	---	pF	V_R=0V, f=1MHz
Detector	Dark current	I_{CEO}	---	--	0.2	uA	V_{CE}=10V
	Collector-emitter voltage	V_{CEO}	16	---	----	V	I_C=100uA
Coupled	Output current	I_O	62	--	155	μA	V_{CE}=2V I_F=4mA d=0.7mm
	Operating dark current *1	I_{CEOD}	---	---	0.5	μA	V_{CE}=2V I_F=4mA
	Rise time	tr	---	20	--	μs	V_{CE}=2V Io=100μA R_L=1KΩ d=0.7mm
	Fall time	tf	---	20	--	μs	

*1: I_{CEOD} may increase according to the periphery situation of the surface mounted product.

2.6.2 Cutter Reset Detection

Cutter position	Status
Home	High
Out	Low



Absolute Maximum Ratings (Ta=25℃)

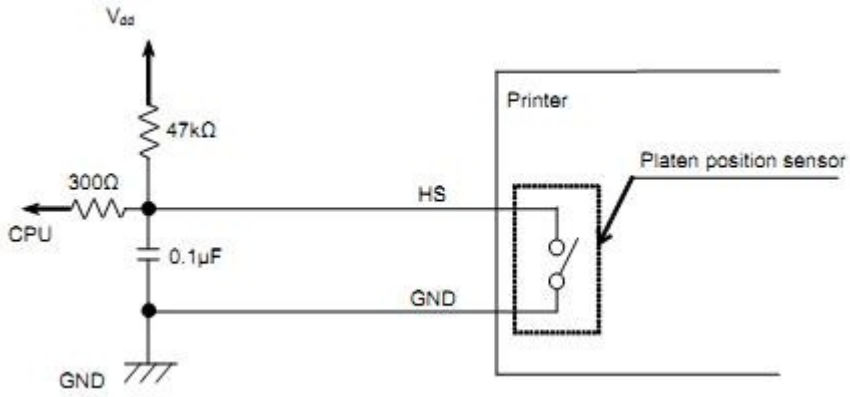
Parameter		Symbol	Limits	Unit
Input(LED)	Forward current	I_F	50	mA
	Reverse voltage	V_R	5	V
	Power dissipation	P_D	80	mW
Output (Photo-transistor)	Collector-emitter voltage	V_{CEO}	30	V
	Emitter-collector voltage	V_{ECO}	4.5	V
	Collector current	I_C	30	mA
	Collector power dissipation	P_C	80	mW
Operating temperature		Topr	-30～+85	℃
Storage temperature		Tstg	-40～+85	℃

Electrical and Optical Characteristics (Ta=25 ℃)

Parameter			Symbol	Min.	Typ.	Max.	Unit	Conditions
Input characteri-stics	Forward voltage		V_F	---	1.8	2.3	V	I_F=50mA
	Reverse current		I_R	---	---	10	μA	V_R=5V
Output Characteri-stics	Dark current		I_{CEO}	---	---	0.1	μA	V_{CE}=10V
	Peak sensitivity wavelength		λ_P	---	800	---	nm	---
Transfer characteri-stics	Collector current		I_C	0.1	---	---	mA	V_{CE}=5V I_F=5mA
	Collector-emitter saturation voltage		$V_{CE(SAT)}$	---	---	0.4	V	I_F=20mA I_C=0.1mA
	Response time	Rise time	t_r	---	30	150	μs	V_{CC}=5V I_F=0.1mA R_L=1000Ω
		Fall time	t_f	---	30	150	μs	
Infrared light emitter diode	Peak light emitting wavelength		λ_P	---	850	---	nm	I_F=50mA
Photo transistor	Response time		t_r.t_f	---	50	---	μs	V_{CC}=5V I_F=0.1mA R_L=1000Ω
	Maximum sensitivity wavelength		λ_P	---	800	---	nm	---

2.6.3 Head-up Detection

E245SG has a mechanical switch, and the logic voltage of its control circuit is 3.3V. When platen opened, the state of the mechanical switch is open. When platen closed, the state of the mechanical switch is closed.



CHAPTER 3 CASING DESIGN GUIDE

3.1 Mechanism Structure Dimensions

Unit: mm
General Tolerance: ±0.5mm