PREPARED BY:	DATE:		
N. Hasegawa	Oct. 23, 1996	SHARP	SPEC. No. ED-93009A
APPROVED BY:	DATE:		ISSUE October 23, 1996
H. Shindo	Oct. 23. '96	ELECTRONIC COMPONENTS GROUP SHARP CORPORATION	PAGE 6 Pages
		SPECIFICATION	REPRESENTATIVE DIVISION OPTO-ELECTRONIC DEVICES DIV.

DEVICE SPECIFICATION FOR

PHOTOTRANSISTOR

MODEL No.

PT4800FB

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2. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets, as well as the precautions mentioned below. Sharp assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets, and the precautions mentioned below.

(Precautions)

(1) This product is designed for use in the following application areas ;

[• OA equipment • Audio visual equipment • Home appliances
• Telecommunication equipment (Terminal) • Measuring equipment
• Tooling machines • Computers]

If the use of the product in the above application areas is for equipment listed in paragraphs (2) or (3), please be sure to observe the precautions given in those respective paragraphs.

(2) Appropriate measures, such as fail-safe design and redundant design considering the safety design of the overall system and equipment, should be taken to ensure reliability and safety when this product is used for equipment which demands high reliability and safety in function and precision, such as ;

[• Transportation control and safety equipment (aircraft, train, automobile etc.)
• Traffic signals • Gas leakage sensor breakers • Rescue and security equipment
• Other safety equipment]

(3) Please do not use this product for equipment which require extremely high reliability and safety in function and precision, such as ;

[• Space equipment • Telecommunication equipment (for trunk lines)
• Nuclear power control equipment • Medical equipment]

(4) Please contact and consult with a Sharp sales representative if there are any questions regarding interpretation of the above three paragraphs.

3. Please contact and consult with a Sharp sales representative for any questions about this product.

CUSTOMER'S APPROVAL

DATE

BY

DATE PRESENTED Oct. 23, 1996

BY Q. Ishikawa

for K. Ebina,
Chief Manager of
Opto-System Project Team
Opto-Electronic Devices Div.
ELECOM Group
SHARP CORPORATION

1. Application

This specification applies to the outline and characteristics of Silicon phototransistor Model No. PT4800FB.

2. Outline

Refer to the attached drawing No. CY6386H02.

3. Ratings and characteristics

Refer to the attached sheet, page 3, 4.

4. Reliability

Refer to the attached sheet, page 5.

5. Incoming inspection

Refer to the attached sheet, page 6.

6. Supplement

This product is not designed as electromagnetic and ionized-particle radiation resistant.

7. Notes

(1) Cleaning conditions :

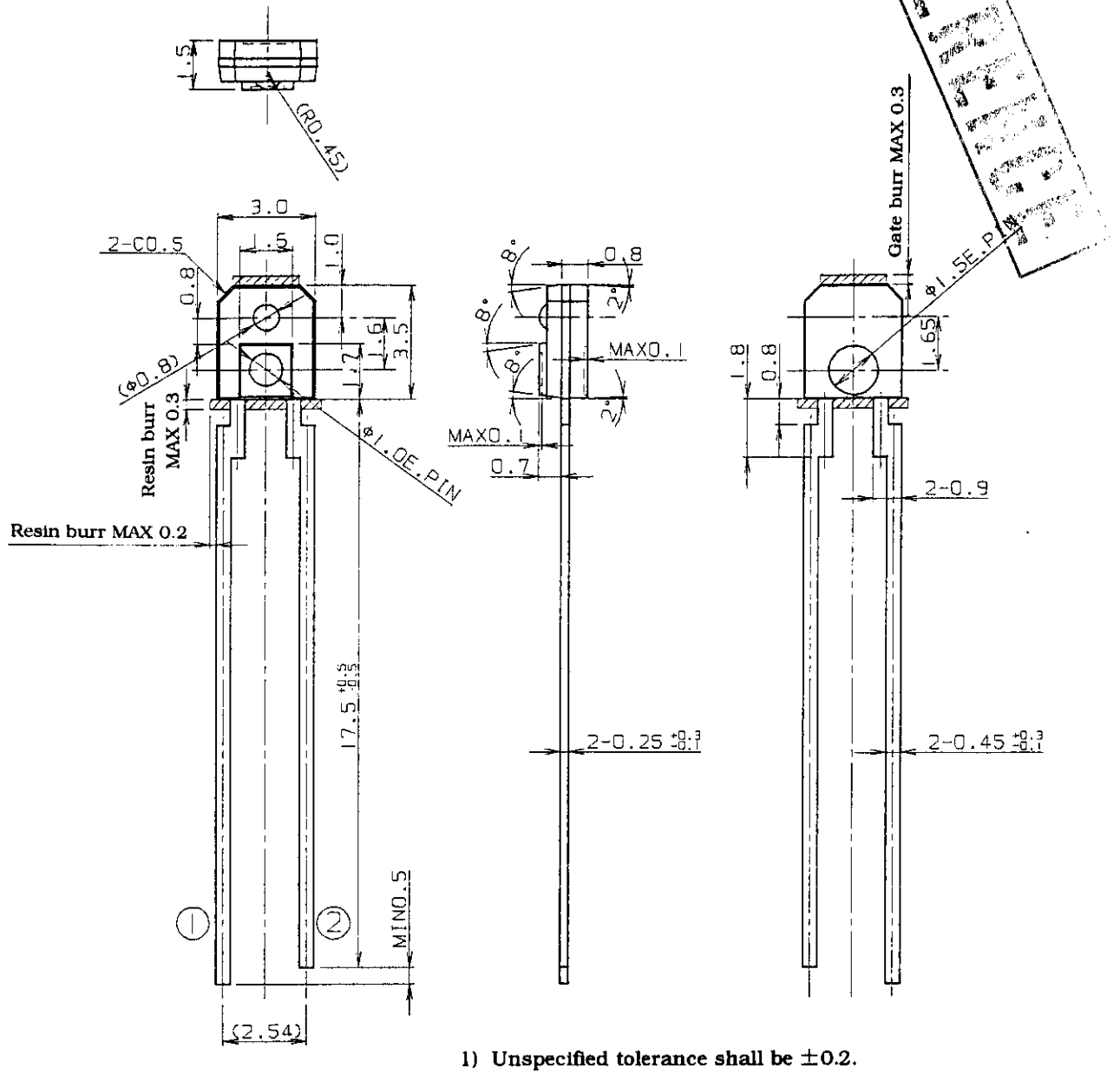
Solvent cleaning : Solvent temperature 45℃ or less
Immersion for 3 min or less

Ultrasonic cleaning : The affect to device by ultrasonic cleaning is different by cleaning bath size, ultrasonic power output, cleaning time, PWB size or device mounting condition etc. Please test it in actual using condition and confirm that doesn't occur any defect before starting the ultrasonic cleaning.

The cleaning shall be carried out with solvent below.

Solvent : Ethyl alcohol, Methyl alcohol, Isopropyl alcohol

(2) The lead pins should be soldered according to the absolute maximum ratings. While or after soldering, the lead pins shall be free from physical stress. This device shall not be soldered with preheat or reflow.



1) Unspecified tolerance shall be ±0.2.
2) Package : Visible light cut-off resin (black)
3) Dimensions in parenthesis are shown for reference.
4) The thin burr thickness (MAX. 0.05mm) and the gate burr (MAX. 0.3mm) shall not be inclusive to the outline dimensions.
5) Protruded resin 0.3mm MAX. However, the thin burr with a lead attached is 1.8mm MAX. from the resin.

Pin name	Terminal connection
① Emitter	
② Collector	

Scale	Material	Finish	Name	PT4800FB Outline Dimensions
5/1	Lead : Cu	Lead : Solder plating		
Unit	Package : Epoxy resin			
1=1/1mm			Drawing No.	CY6386H02

3. Ratings and characteristics

3.1 Absolute maximum ratings

Ta=25℃

Parameter	Symbol	Rating	Unit
Collector-emitter voltage	V_{CEO}	35	V
Emitter-collector voltage	V_{ECO}	6	V
Collector current	Ic	20	mA
Collector power dissipation	Pc	75	mW
Operating temperature	Topr	-25 to +85	℃
Storage temperature	Tstg	-40 to +85	℃
* Soldering temperature	Tsol	260	℃

* For 3 seconds MAX. at the position of 1.8mm from the resin edge.

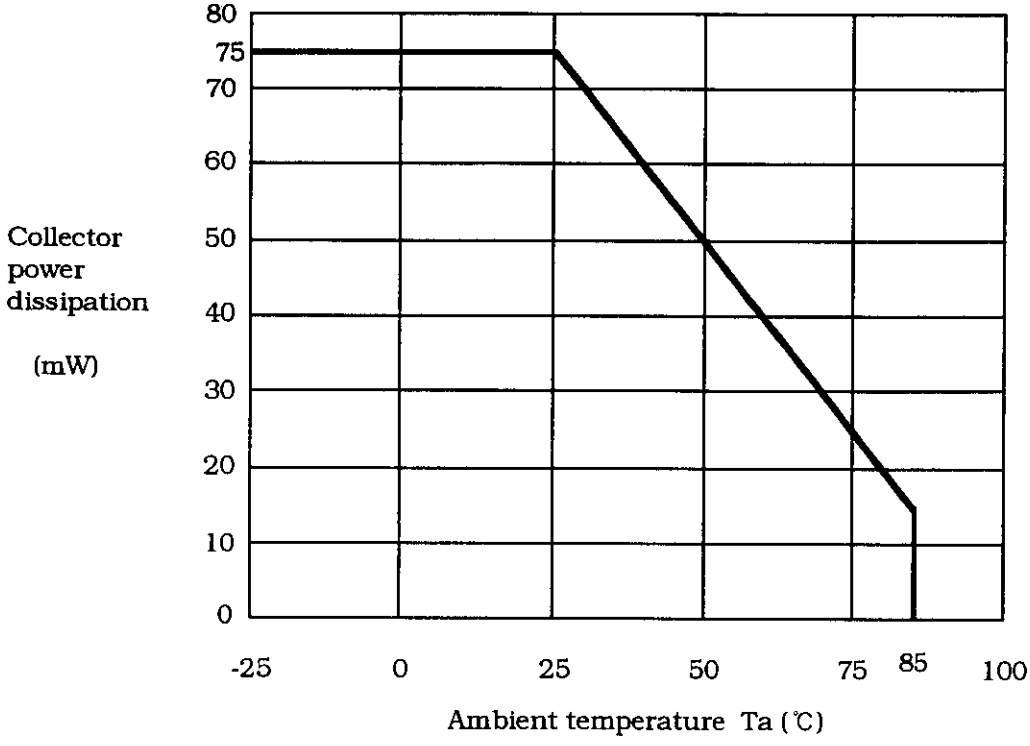
3.2 Electro-optical characteristics

Ta=25℃

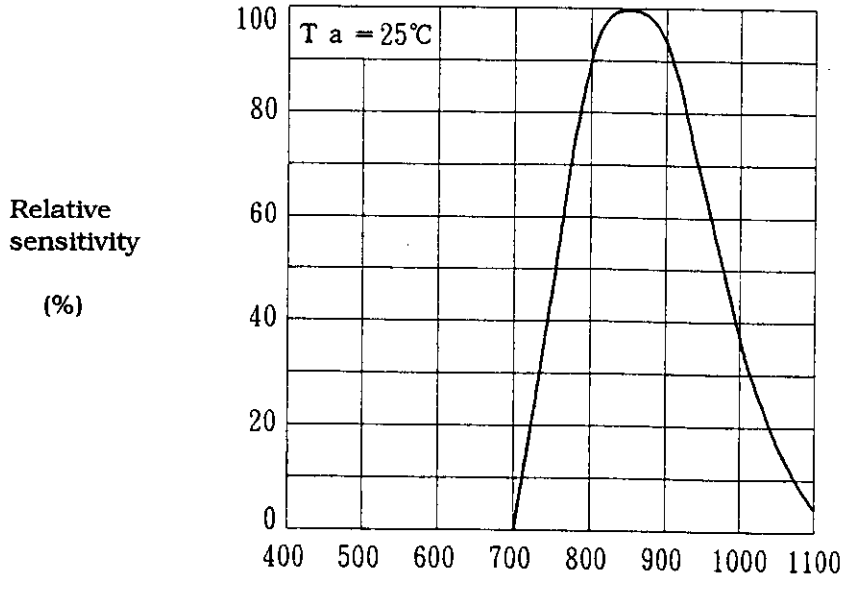
Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Conditions
Collector current	Ic	0.15	-	0.38	mA	※ Ee=1mW/cm^2 V_{CE}=5V
Dark current	I_{CEO}	-	-	100	nA	Ee=0, V_{CE}=20V
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.4	V	Ee=10mW/cm^2 Ic=0.5mA
Collector-emitter breakdown voltage	BV_{CEO}	35	-	-	V	Ic=0.1mA Ee=0
Emitter-collector breakdown voltage	BV_{ECO}	6	-	-	V	I_E=0.01mA Ee=0
Peak sensitivity wavelength	λp	-	860	-	nm	
Response time (Rise)	tr	-	3.0	-	μs	V_{CE}=2V, Ic=2mA
Response time (Fall)	tf	-	3.5	-	μs	R_L=100Ω
Angle of half intensity	θ	-	±35	-	°	

※ Ee : Irradiance by CIE standard light source A (tungsten lamp)

(3.3) Collector power dissipation vs. ambient temperature



(3.4) Spectral sensitivity (TYP.)



4. Reliability

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%
LTPD : 10%/20%

Test Items	Test Conditions	Failure Judgement Criteria	Samples (n) / Defective(C)
Temperature cycling	1 cycle -40℃←→+85℃ (30min) (30min) 20 cycles test	Ic≦L×0.8 Ic≧U×1.2 I_{CEO}≧U×2.0 $V_{CE(sat)}$≧U×1.2 U: Upper specification limit L: Lower specification limit	n=22, C=0
High temp. and high humidity storage	+60℃,90%RH, 500h		n=22, C=0
High temp. storage	+85℃, 500h		n=22, C=0
Low temp. storage	-40℃, 500h		n=22, C=0
Operation life	Pc=50mW, Ta=25℃, 500h		n=22, C=0
Mechanical shock	1000m/s^2, 6ms, Half sine wave 3 times/ ±X, ±Y, ±Z direction		n=11, C=0
Variable frequency vibration	200m/s^2 100 to 2000 to 100Hz /For approx. 4min 48 min/X, Y, Z direction		n=11, C=0
Terminal strength (Tension)	Weight: 5N 10 s/each terminal		n=11, C=0
Terminal strength (Bending)	Weight: 2.5N 0° →90° →0° The one test should be performed.		n=11, C=0
Soldering heat	260℃, 5 s		n=11, C=0
Solderability	230℃, 5 s Prior disposition: Dip in login flux. Position of 1.8mm from the resin edge.	Solder shall be adhere at less than 95% area of dipped portion.	n=11, C=0

5. Incoming inspection

(1) Inspection lot

Inspection shall be carried out per each delivery lot.

(2) Inspection method

A single sampling plan, normal inspection level Ⅱ based on ISO 2859 shall be adopted.

<table>
<tr><th colspan="2">Parameter</th><th>Inspection items and test method</th><th>AQL(%)</th></tr>
<tr><td rowspan="4">Major defect</td><td>1</td><td>Disconnection, short</td><td rowspan="4">0.1</td></tr>
<tr><td>2</td><td>Inverse polarity on terminal</td></tr>
<tr><td>3</td><td>Soldering defect (Obstacle to use)</td></tr>
<tr><td>4</td><td>Characteristics defect
<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Symbol</th><th colspan="2">Judgement criteria</th><th rowspan="2">Unit</th></tr>
<tr><th>MIN.</th><th>MAX.</th></tr>
<tr><td>Collector current</td><td>Ic</td><td>0.15</td><td>0.38</td><td>mA</td></tr>
<tr><td>Dark current</td><td>I_{CEO}</td><td>-</td><td>100</td><td>nA</td></tr>
<tr><td>Collector-emitter breakdown voltage</td><td>BV_{CEO}</td><td>35</td><td>-</td><td>V</td></tr>
<tr><td>Emitter-collector breakdown voltage</td><td>BV_{ECO}</td><td>6.0</td><td>-</td><td>V</td></tr>
</table>
Test conditions refer to parameter 3.2.</td></tr>
<tr><td>Minor defect</td><td>1</td><td>Appearance defect
<table>
<tr><th>Parameter</th><th>Judgement criteria</th></tr>
<tr><td>Crack</td><td>Visible crack irrespective of its position shall be defect.</td></tr>
<tr><td>Split, Chip, Scratch, Stain, Blur</td><td>One which affects the characteristics of parameter 3.2 shall be defect.</td></tr>
</table></td><td>0.4</td></tr>
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