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SHARP

ELECTRONIC COMPONENTS
GROUP SHARP CORPORATION

SPECIFICATION

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PAGE 7 Pages

REPRESENTATIVE DIVISION

OPTO-ELECTRONIC
DEVICES DIV.

DEVICE SPECIFICATION FOR

INFRARED EMITTING DIODE

MODEL No.

GL1F20

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2. Please obey the instructions mentioned below for actual use of this device.
SHARP takes no responsibility for damage caused by improper use of the devices.

(1) This device is designed for general electronic equipment.

Main uses of this device are as follows;

- Computer • OA equipment . Telecommunication equipment (Terminal)
- Measuring equipment . Tooling machine • AV equipment • Home appliance, etc.

(2) Please take proper steps in order to maintain reliability and safety, in case this device is used for the uses mentioned below which require high reliability.

- Unit concerning control and safety of a vehicle (air plane, train, automobile etc.)
- Traffic signal • Gas leak detection breaker • Fire box and burglar alarm box
- Other safety equipment, etc.

(3) Please do not use for the uses mentioned below which require extremely high reliability.

- Space equipment . Telecommunication equipment (Trunk)
- Nuclear control equipment • Medical equipment etc.

Contact a SHARP representative of sales office in advance when you intend to use SHARP devices for any applications other than those applications for general electronic equipment recommend by SHARP at (1).

CUSTOMER'S APPROVAL

DATE

BY

DATE
PRESENTED
BY

K. E

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1. Application

This specification applies to the outline and characteristics of GaAlAs type chip infrared emitting diode Model No. GL1F20.

2. Outline

Refer to the attached drawing No. CY8076i02.

3. Ratings and characteristics

Refer to the attached sheet, page 4, 5.

4. Reliability

Refer to the attached sheet, page 6.

5. Incoming inspection

Refer to the attached sheet, page 7.

6. Supplement**7. Notes**

(1) In circuit designing, make allowance for the degradation of the light emitting diode output that results from long continuous operation. (MAX. 50% degradation/ 5 years)

(2) Cleaning conditions :

Solvent cleaning : Solvent temperature 45 °C or less
Immersion for 3 min or less

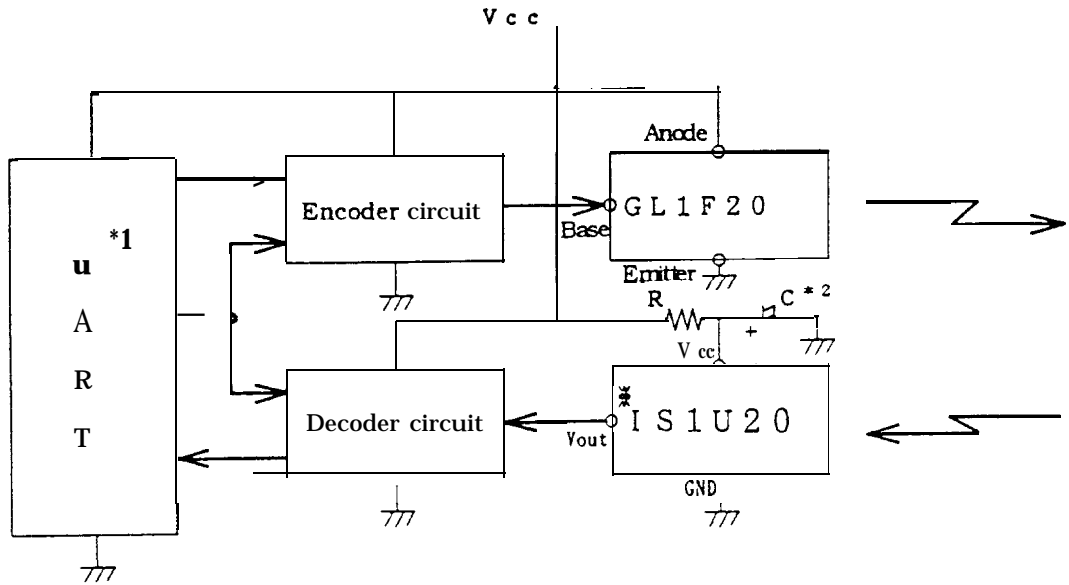
Ultrasonic cleaning : The affect to device by ultrasonic cleaning is different by cleaning bath size, ultrasonic power output, cleaning time, PCB size or device mounting condition etc. Please test it in actual using condition and confirm that doesn't occur any defect before starting the ultrasonic cleaning.

The cleaning shall be carried out with solvent below.

Solvent : Ethyl alcohol, Methyl alcohol, Isopropyl alcohol

(3) 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.

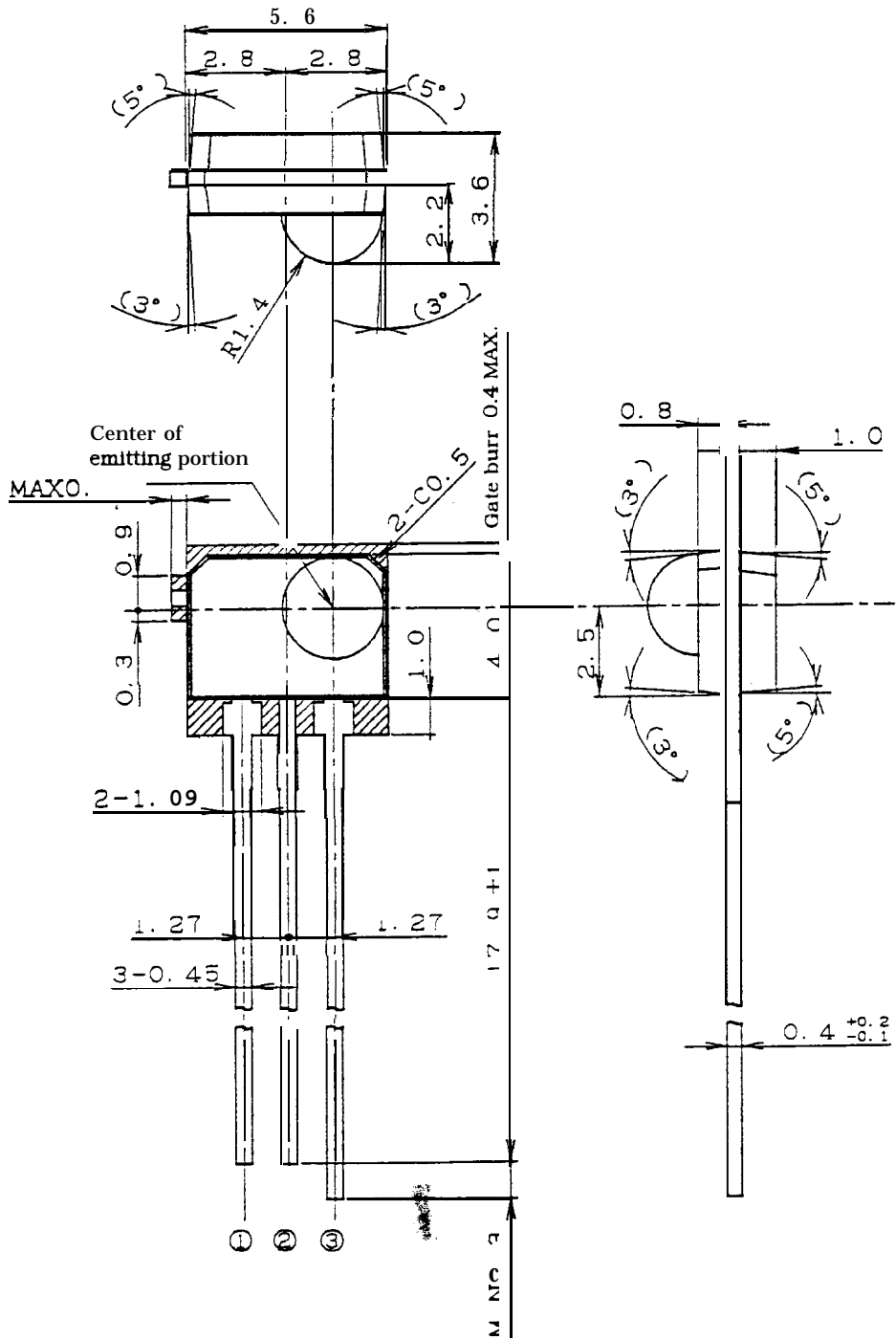
(4) Example of system



* 1 UART (Universal Asynchronous Receiver/Transmitter)

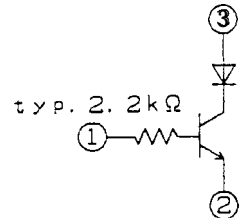
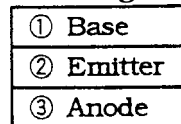
*2 Please choose the most suitable C and R according to the noise level and noise frequency of power supply.
Example : C=47 μ F, R=47 Ω

※ We recommended to use IS1U20 as detecting device.



- 1) Unspecified tolerance shall be ± 0.2 .
- 2) Dimensions in parenthesis are shown for reference.
- 3) area : Burr
- 4) Resin burr shall not be included in outline dimensions.
- 5) Package : Transparent

6) Pin arrangement



7) Lead pitch distance denotes that of the lead root.

Scale	Material	Finish	Name	GL1F20
5/1	Lead :Cu	Lead: Solder dip		Outline Dimensions
Unit	Package: Epoxy resin		Drawing No.	CY8076i02
1=1/1mm				

3. Ratings and characteristics

3.1 Absolute maximum ratings

Ta=25°C

Parameter	symbol	Rating	unit
Forward current	I_F	50	MA
*1 Peak forward current	I_{FM}	400	MA
Operating temperature	Topr	-10 to +70	°C
Storage temperature	Tstg	-20 to +85	°C
*2 Soldering temperature	Tsol	260	°C

*1 Pulse width :78.1 μ s, Duty ratio : 3/16

*2 For 3 s MAX. at the position of 2mm from the resin edge.

3.2 Electro-optical characteristics

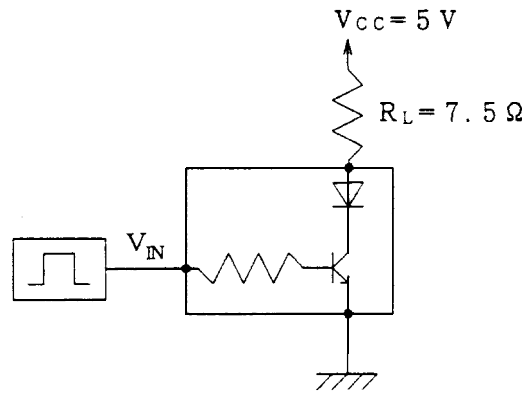
Ta=25°C

Parameter	symbol	MIN.	TYP.	MAX.	unit	Conditions
Radiant intensity	I_E	40	-	350	nW/sr	VCC=5V, $R_L=7.5\Omega$ $V_N=4.5V$ *3 $t_{WIN}=1.63\mu s$ DR=3/16 $\phi \leq 15^\circ$ *4
Rise time	t_r		0.23	0.6	μs	
Fall time	t_f		0.17	0.6	μs	
Pulse width	t_w	1.41	1.6	2.71	μs	
Operating voltage	Vcc	4.75	-	5.25	v	-
High level input voltage	V_{HI}	4.5	-	Vcc	v	-
Low level input voltage	V_L	-	-	0.4	v	-
Input current	I_{IH}	1.0	-	3.0	MA	$V_N=4.5V$ *3
Peak emission wavelength	λ_p	850	870	900	nm	$I_F=20mA$
Spectrum radiation bandwidth	$\Delta \lambda$		40		nm	$I_F=20mA$
Half intensity angle	$\Delta \theta$		± 20		°	$I_F=20mA$

*3 Refer to the Recommended circuit

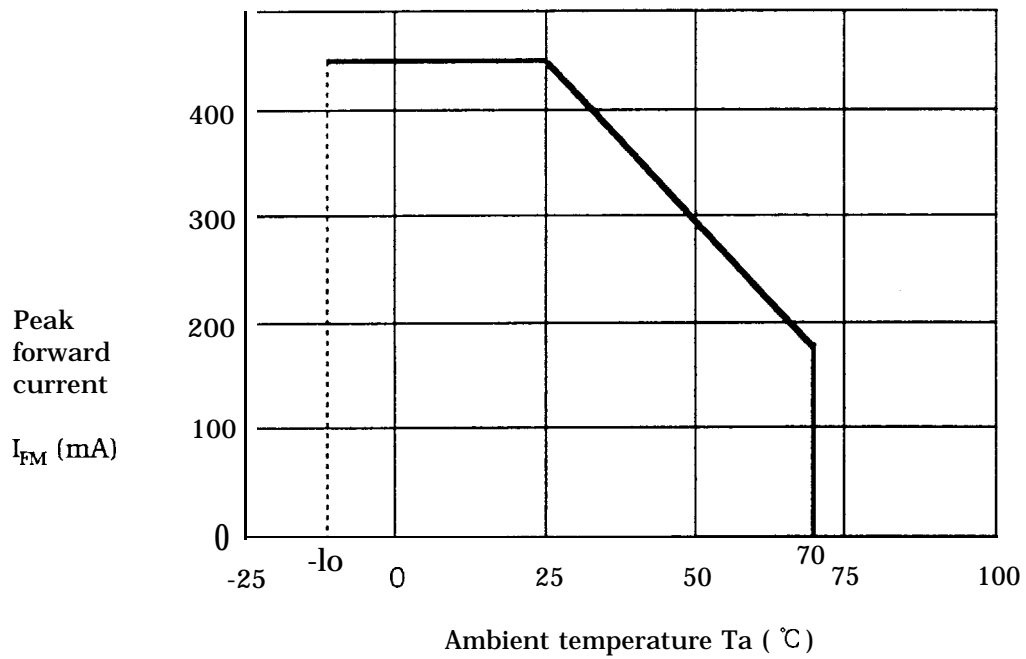
*4 It is $\phi = 0^\circ$ in the direction of mechanical axis of lens portion.

• Recommended circuit



(3.3) Peak forward current vs. ambient temperature

Pulse width $\leq 78.1 \mu s$, Duty ratio 3/16



4. Reliability

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

Confidence level : 90%

LTPD : 20%

Test Items	Test Conditions	Failure Judgement Criteria	Samples (n)
			Defective(C)
Temperature cycling	1 cycle -20°C ↔ +85°C (30min) (30min) 20 cycles test	$L \times 0.8 \leq I_E$ $\leq U \times 1.2$ $t_r \leq U \times 1.2$ $t_f \leq U \times 1.2$ $L \times 0.8 \leq t_w$ $\leq U \times 1.2$ U: Upper specification limit L: Lower specification limit	n=11, C=0
High temp. and high humidity storage	+60°C, 90%RH, 240h		n=11, C=0
High temp. storage	+85°C, 240h		n=11, C=0
Low temp. storage	-20°C, 240h		n=11, C=0
Operation life	Ta=25°C, I _{FM} =400mA t _{WN} =78.1μs, DR=3/16, 240h		n=11, 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 /Approx. for 4min 48 rein/X, Y, Z direction		n=11, C=0
Terminal strength (Tension)	Weight: 5.0N 10s /each terminal		n=11, C=0
Terminal strength (Bending)	Weight: 2.5N 0° → 90° → 0° → -90° → 0° 2 times bending		n=11, C=0
Soldering heat	260 ± 5°C, 3 s		n=11, C=0
Solderability	230 ± 5°C, 5 s Prior disposition: Dipped position is shown in parameter 3.1 *2.	Solder shall be adhere at the area of 95% or more 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 MIL-STD- 105D shall be adopted.

Parameter		Inspection items and test method				AQL(%)	
Major defect	1	Disconnection, short				0.1	
	2	Inverse polarity on terminal					
	3	Soldering defect (Obstacle to use)					
	4	Characteristics defect					
		Parameter	symbol	Judgement criteria			unit
				MIN	MAX.		
		Radiant intensity	I_E	40	350		mW/sr
		Rise time	t_r		0.6		μs
		Fall time	t_f		0.6		/us
		Pulse width	t_w	1.41	2.71		μs
	Test conditions refer to parameter 3.2.						
Minor defect	1	Appearance defect				0.4	
		Parameter	Judgement criteria				
		Crack	Visible crack irrespective of its position shall be defect.				
		split, chip, Scratch, Stain, Blur	One which affects the characteristics of parameter 3.2 shall be defect.				
	Bubble Foreign matter (One on resin surface which can wipe off shall not be applied.)	1. On light detector One which affects the characteristics of parameter 3.2 shall be defect. 2. Area excepting on light detector 1.0mm ϕ or more shall be defect.					