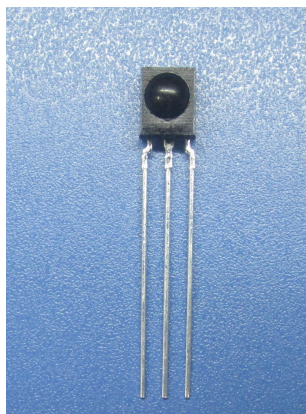


SPECIFICATION FOR APPROVAL

COMMODITY: Infrared Remote-Control Receiver Module

DEVICE NUMBER: DL-4D3H81IL-H5



CUSTOMER APPROVEDBY	DATE

Double Light

◆ Features:

1. Within the Shielding, High protection ability against EMI
2. Wide voltage operating: 2.7V~6.0V
3. Wide half angle & long reception distance
4. Automatic supply voltage adaptation
5. Enhanced immunity against all kind of disturbance light
6. TTL and CMOS compatibility
7. Automatic sensitivity adaptation (AGC) and automatic Strong signal adaptation (ATC)
8. Automatic bias control for sunlight

◆ Center frequency

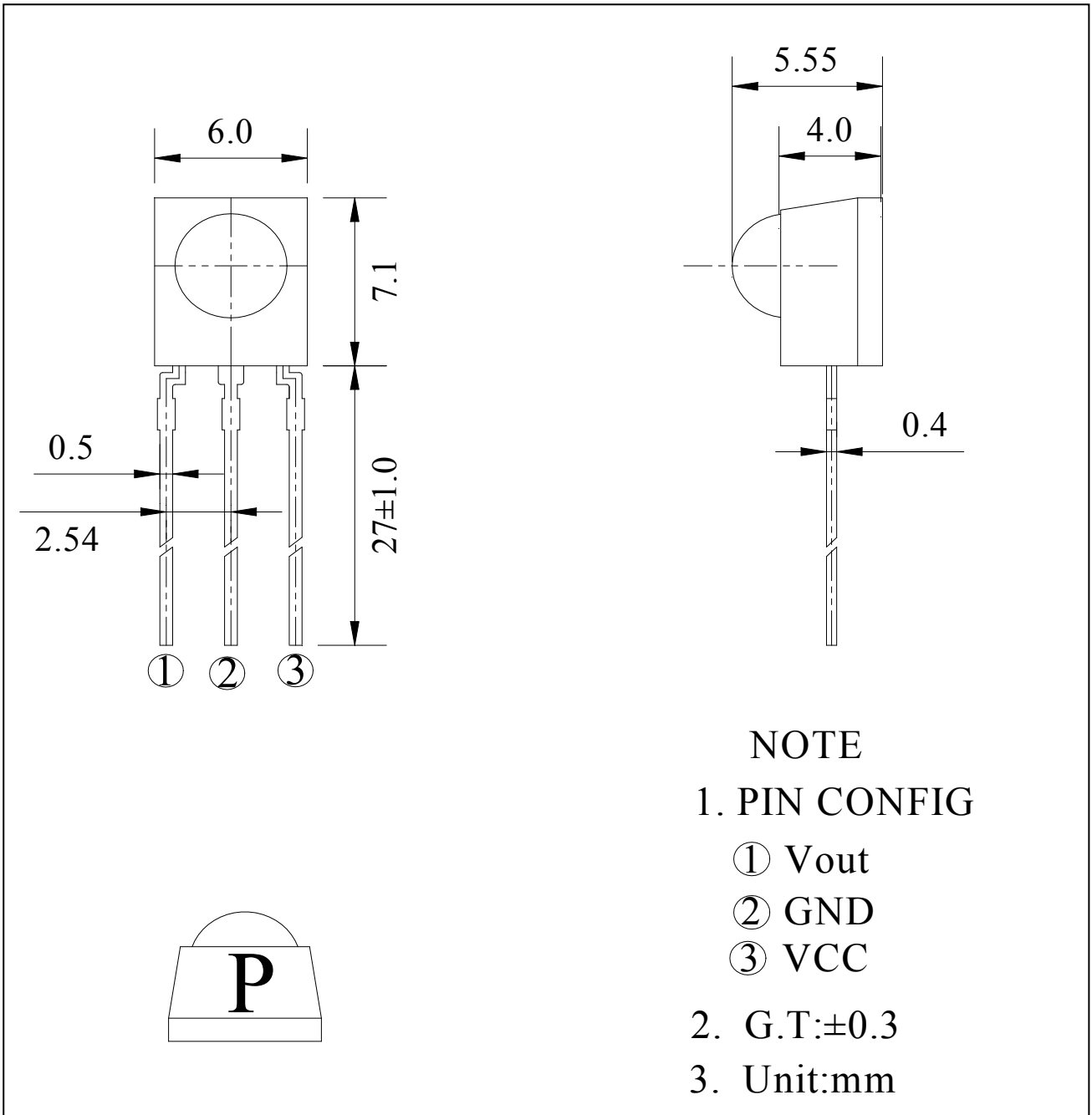
37.9 KHz

◆ Applications:

1. AV equipment (TV, DVD Player, VCR, Audio, CD player, STB, etc)
2. Home appliances (Camera, Computer Air Conditioner, Fan, light, etc)
3. Infrared remote control Toys.

Double Light

◆ Package dimensions:



Part No.	Chip Material	Lens Color	Source Color
DL-4D3H81IL-H5	Silicon	Black	Infrared Receiver

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (0.01") unless otherwise specified.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.

◆ Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Double Light

Parameter	Symbol	Ratings	Unit
Supply Voltage	Vcc	6.5	V
Operating Temperature	Topr	-25~ +80	°C
Storage Temperature	Tstg	-40 ~ +85	°C
Soldering Temperature *1	Tsol	260	°C

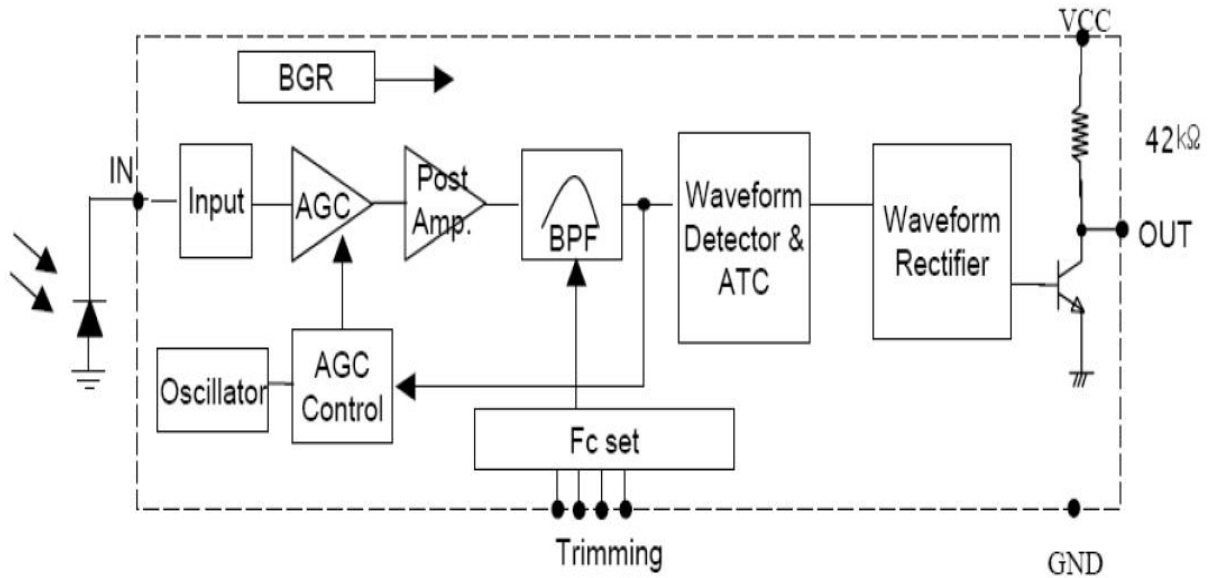
◆ Electrical Optical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	Vcc		2.7		6.0	V
Supply Current	Icc	No Input Signal	0.5	1.0	1.5	mA
Reception Distance	d	200±50Lux		40		m
Half Angle (Horizontal)	$\Delta\theta_h$			±45		deg
Half Angle (Vertical)	$\Delta\theta_v$			±45		deg
B.P.F. Center Frequency	Fo			37.9		KHz
Peak Wavelength	λ_p			940		nm
Signal Output	So		--- Active Low ---			
High Level Output Voltage	Voh		VDD-0.3		VDD	V
Low Level Output Voltage	Vol				0.4	V
High Level Pulse Width	Twh	Burst Wave = 600μs	400	--	800	μs
Low Level Pulse Width	Twl	Burst Wave = 600μs	400	--	800	μs

Notes:

1. The ray receiving surface at a vertex and relation to the ray axis in the range of $\theta=0^\circ$ and $\theta=45^\circ$.
2. A range from 30cm to the arrival distance. Average value of 50 pulses.

◆ Block Diagram



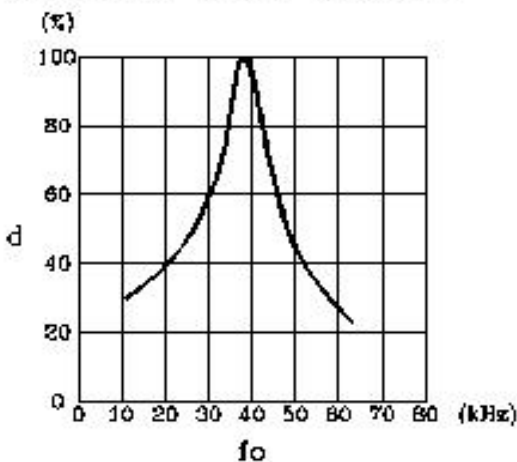
◆ Reliability Test Items

Test Items	Test Conditions	Ratings
High Temperature Storage	Ta=+85°C, Vcc=3.0V	t=240hr.
Low Temperature Storage	Ta=-40°C, Vcc=3.0V	t=240hr.
High Temperature High Humid Storage	Ta=40°C, 90%RH, Vcc=3.0V	t=240hr.
Temperature Cycling	-40°C (30min) ~+85°C (30min)	20cycles test

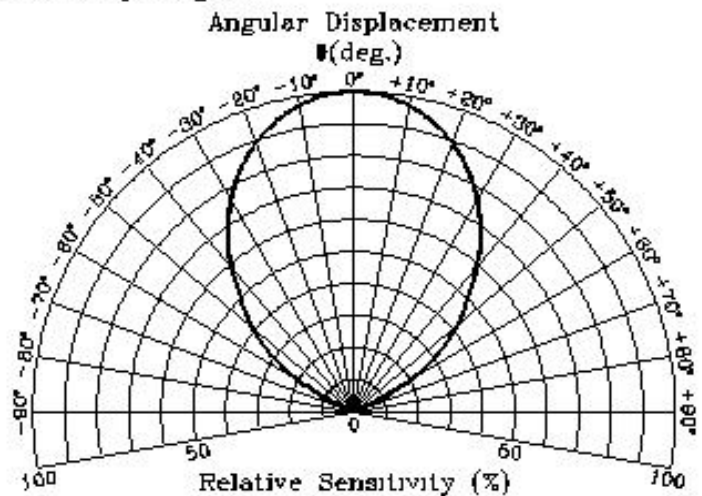
◆ Typical Electrical - Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

Relative Reception Distance vs Transmitter Carrier Frequency



Sensitivity Diagram



◆ Standard Inspection

Double Light

1. Among electrical characteristics, total quantity will be inspected as below:
2. Distance between emitter and detector
3. Current consumption
4. H level output voltage
5. L level output voltage

◆ Testing Method

Distance between emitter and detector specifies maximum distance that output waveform satisfies the standard (FIG-1) under the conditions below against the standard transmitter.

1. Measuring place
Indoor without extreme reflection of light.
2. Ambient light source
Detecting surface illumination is 200 ± 50 Lux under ordinary white fluorescence lamp of no high frequency lightning.
3. Standard transmitter
Transmitter wave indicated in FIG-2 of standard transmitter is arranged to satisfy $V_o \geq 50$ mVp-p under the measuring circuit specified in FIG-3

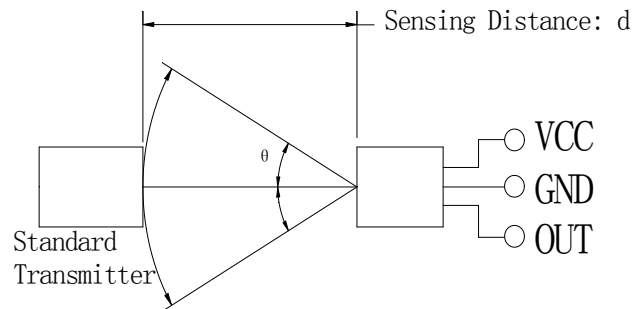
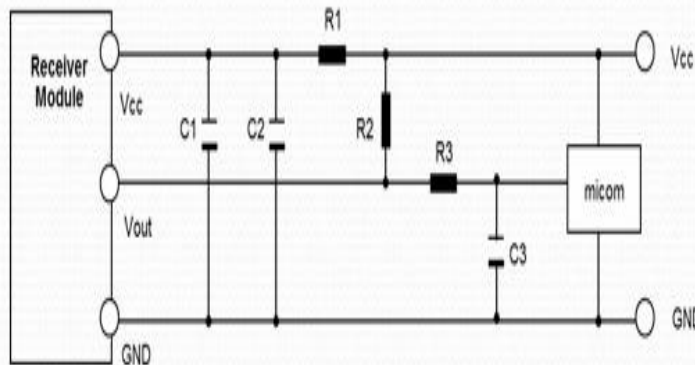
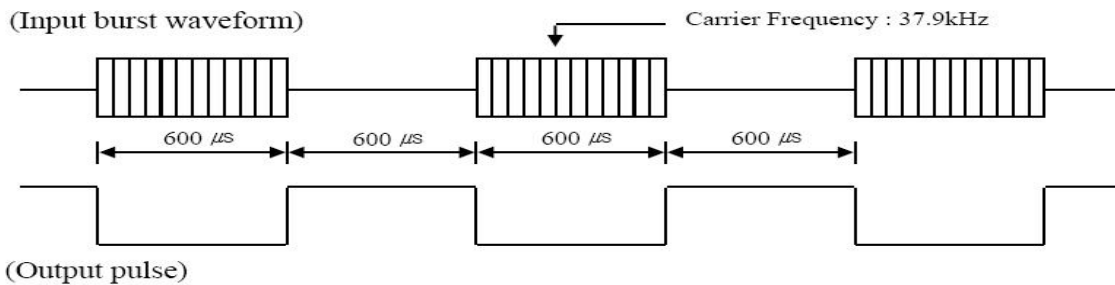


FIG-1



item	R1	R2	R3
value	47Ω ~ 100Ω	More than 10 kΩ	330Ω
item	C1	C2	C3
value	0.1 uF	47 uF	1nF~4.71nF

◆ Reliability Test

Double Light

Classification	Test Item	Reference Standard	Test Conditions	Result
Endurance Test	Operation Life	MIL-STD-750:1026 MIL-STD-883:1005 JIS-C-7021 :B-1	Connect with a power $I_f=20\text{mA}$ T_a =Under room temperature Test time=1,000hrs	0/20
	High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	$T_a=+65^{\circ}\text{C}\pm 5^{\circ}\text{C}$ RH=90%-95% Test time=240hrs	0/20
	High Temperature Storage	MIL-STD-883:1008 JIS-C-7021 :B-10	High $T_a=85^{\circ}\text{C}\pm 5^{\circ}\text{C}$ Test time=1,000hrs	0/20
	Low Temperature Storage	JIS-C-7021 :B-12	Low $T_a=-35^{\circ}\text{C}\pm 5^{\circ}\text{C}$ Test time=1,000hrs	0/20
Environmental Test	Temperature Cycling	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS-C-7021 :A-4	$-35^{\circ}\text{C} \sim +25^{\circ}\text{C} \sim +85^{\circ}\text{C} \sim +25^{\circ}\text{C}$ 60min 20min 60min 20min Test Time=5cycle	0/20
	Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	$35^{\circ}\text{C}\pm 5^{\circ}\text{C} \sim +85^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 20min 20min Test Time=10cycle	0/20
	Solder Resistance	MIL-STD-202:201A MIL-STD-750:2031 JIS-C-7021 :A-1	Preheating: $140^{\circ}\text{C}-160^{\circ}\text{C}$, within 2 minutes. Operation heating: 235°C (Max.), within 10seconds (Max.)	0/20

◆ Judgment criteria of failure for the reliability

Measuring items	Symbol	Measuring conditions	Judgment criteria for failure
Forward voltage	V_F (V)	$I_F=20\text{mA}$	Over $U_x1.2$
Reverse current	I_R (μA)	$V_R=5\text{V}$	Over U_x2
Luminous intensity	I_v (mcd)	$I_F=20\text{mA}$	Below $SX0.5$

Notes:

- U means the upper limit of specified characteristics. S means initial value.
- Measurement shall be taken between 2 hours and after the test pieces have been returned to normal ambient conditions after completion of each test.

◆ Soldering:

Double Light

1. Manual of Soldering

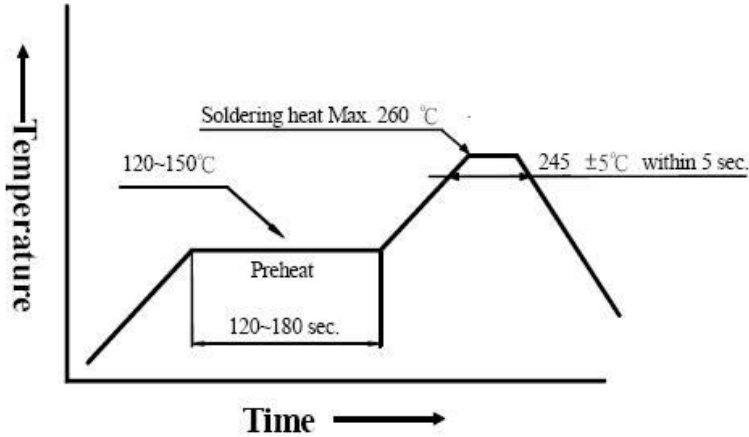
The temperature of the iron tip should not be higher than 300°C (572°F) and Soldering within 3 seconds per solder-land is to be observed.

2. Reflow Soldering

Preheating: 140°C~160°C±5°C, within 2 minutes.

Operation heating: 235°C (Max.) within 10 seconds (Max)

Gradual Cooling (Avoid quenching).

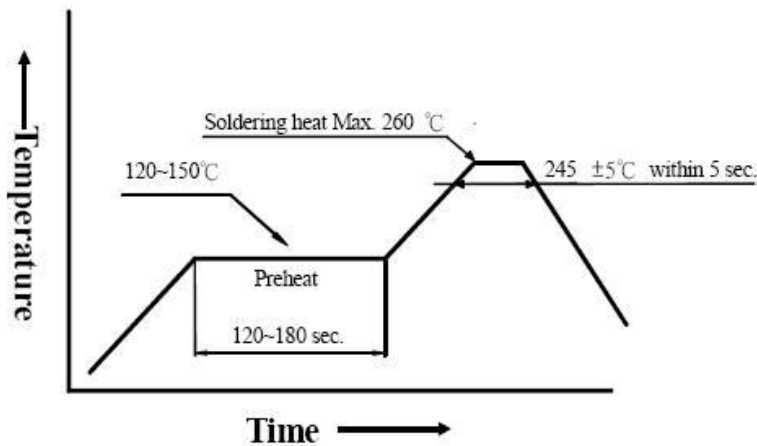


3. DIP soldering (Wave Soldering):

Preheating: 120°C~150°C, within 120~180 sec.

Operation heating: 245°C±5°C within 5 sec. 260°C (Max)

Gradual Cooling (Avoid quenching).



◆ Handling :

Double Light

Care must be taken not to cause to the epoxy resin portion of LEDs while it is exposed to high temperature. Care must be taken not rub the epoxy resin portion of LEDs with hard or sharp article such as the sand blast and the metal hook.

◆ **Notes for designing:**

Care must be taken to provide the current limiting resistor in the circuit so as to drive the LEDs within the rated figures. Also, caution should be taken not to overload LEDs with instantaneous voltage at the turning ON and OFF of the circuit.

When using the pulse drive care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as be subjected to reverse voltage when turning off the LEDs.

◆ **Storage:**

In order to avoid the absorption of moisture, it is recommended to solder LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, to store it in the environment as following:

- 1) Temperature : 5°C-30°C (41°F), Humidity : RH 60% Max.
- 2) After this bag is opened, devices that will be applied to infrared reflow, vapor-phase reflow, or equivalent soldering process must be:
 - a) Completed within 24 hours.
 - b) Stored at less than 30% RH.
- 3) Devices require baking before mounting, if (2) a or (2) b is not met.
- 4) If baking is required, devices must be baked under below conditions: 12 hours at 60°C±3°C.

◆ **Package and Label of Products:**

Products are packed in one bag of 500pcs (one taping reel) and a label is attached on each bag.