PH311

Version	**: A.002**
Issue Date	**: 2007/11/21**
File Name	**: SP-PH311-A.002.doc**
Total Pages	**: 11**

LIGHT-TO-VOLTAGE CONVERTERS

新竹市科學園區展業一路 9 號 7 樓之 1
SILICON TOUCH TECHNOLOGY INC.
9-7F-1, Prosperity Road I, Science Based Industrial Park,
Hsin-Chu, Taiwan 300, R.O.C.
Tel：886-3-5645656 Fax：886-3-5645626

LIGHT-TO-VOLTAGE CONVERTERS

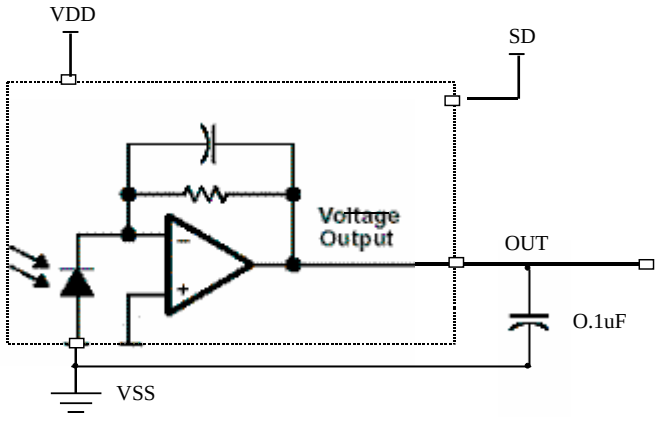
GENERAL DESCRIPTION

PH311 is a low-noise, high-sensitivity and light-to-voltage converter . The device integrates a photodiode and a trans-impedance amplifier in a single IC and is characterized by its peak wavelength at 800 nm.

FEATURES

1. Integrating photodiode, operational amplifier, and feedback components.
2. Tiny SMD type package:
Width:2 mm
Height: 1.3 mm
Depth: 0.5mm
3. High sensing illuminance responsivity (0~550lx).
4. Rail-to-Rail Output
5. Wide power supply range(2.7~5.5V) .
6. Reject 50Hz /60Hz light ripple Noise
7. High power-supply rejection
8. Shut-Down function
9. Excellent output linearity of illuminance.

FUNCTIONAL BLOCK DIAGRAM



To ADC or Controller.

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	-0.5~6	V
Output Current	Io	±10	mA
Operating Temperature	Topr	-25 to +85	℃
Storage Temperature	Tstg	-40 to +85	℃
Electrostatic Damage	ESD	4	kV

RECOMMENDED OPERATING CONDITIONS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{DD}	2.7	3.3 5.0	5.5	V

ELECTRICAL CHARACTERISTICS (V_{DD}=5V, TA=25℃, if not mentioned)

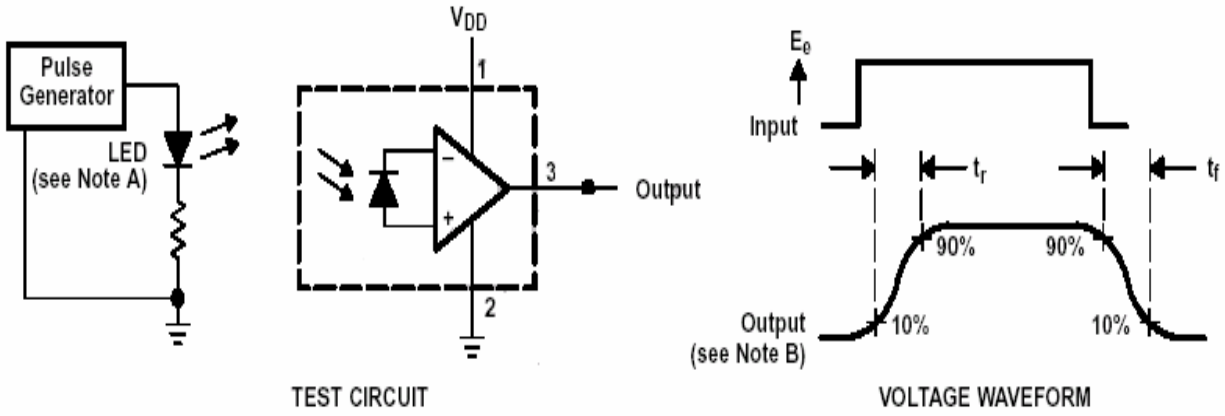
ITEM	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Dark Voltage	V_D	Ee = 0 lx			25	mV
Max Output Voltage Swing	V_{OM}	VDD = 5V	4.7	4.9	5.0	V
Output Voltage	V_O	Ee =100 lx (Note 1)	0.645	0.86	1.075	V
Illuminance Responsivity	Rv	(Note 1)	6.45	8.6	10.75	mV/lx
Supply Current	$I_{DD\ (0\ lx)}$	V_{DD}=5V, Ee =0 lx	52	65	78	uA

Note 1: Fluorescence light is used as light source. However, white LED is substituted in a mass-production process.

SWITCHING CHARACTERISTICS (V_{DD} = 5 V, T_A = 25℃, unless otherwise noted)

ITEM	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Pulse Rise Time (10% to 90% of Final Value)	tr	Ee = 0 lx to 660 lx	30	60	100	ms
Output Pulse Fall Time (10% to 90% of Final Value)	tf	Ee = 660 lx to 0 lx	30	60	100	ms

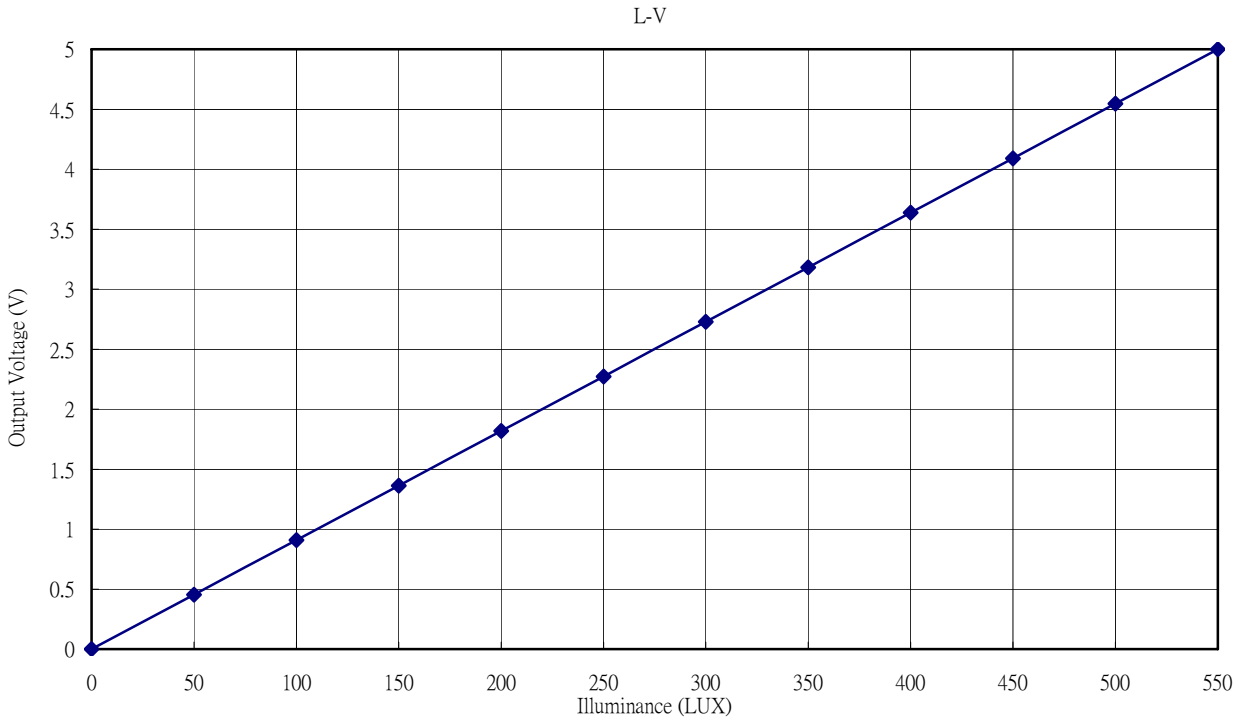
Parameter Measurement Information



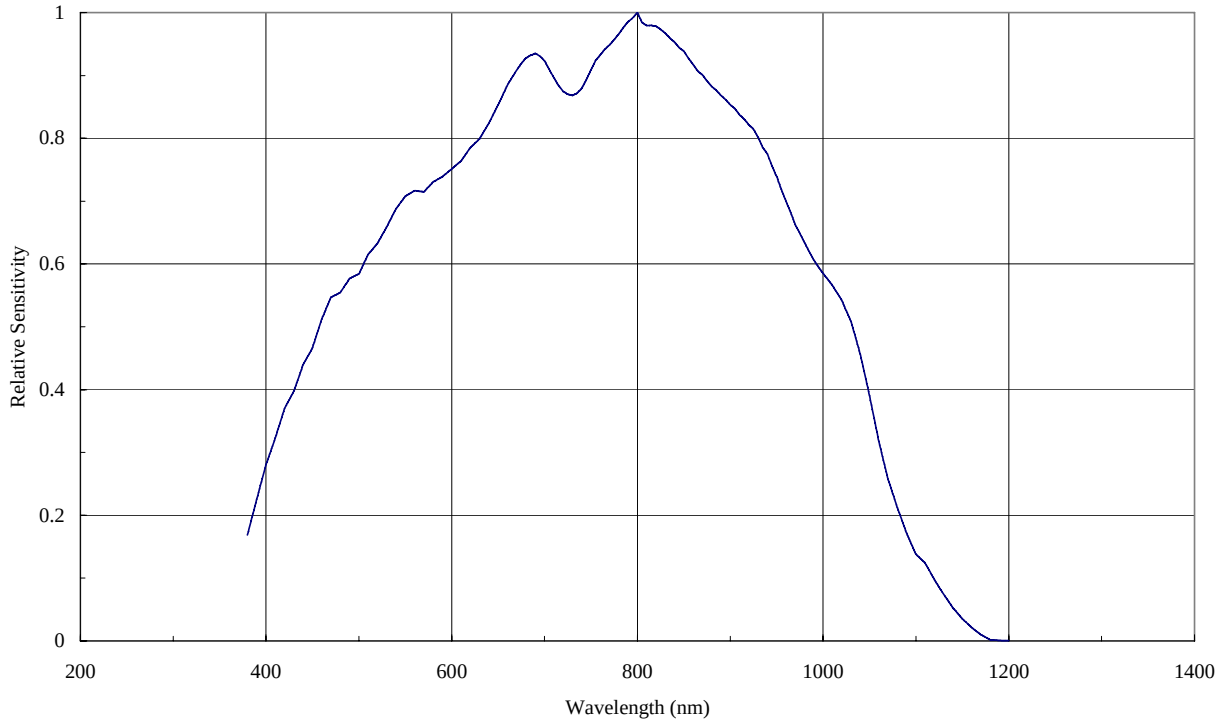
NOTES: A. The input irradiance is supplied by a pulsed light-emitting diode with the following characteristics: tr < 1us, tf < 1us.

B. The output waveform is monitored on an oscilloscope with the following characteristics: tr <100ns, Zi≧1M Ohm, C_L=13pF.

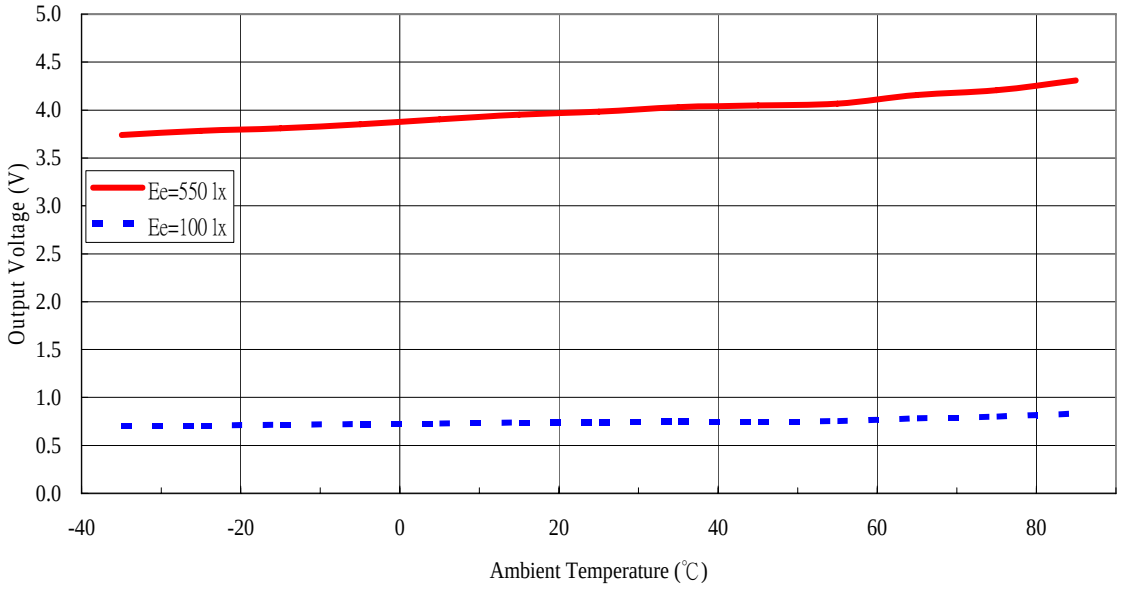
Output Voltage v.s. Illuminance Ev (lux)



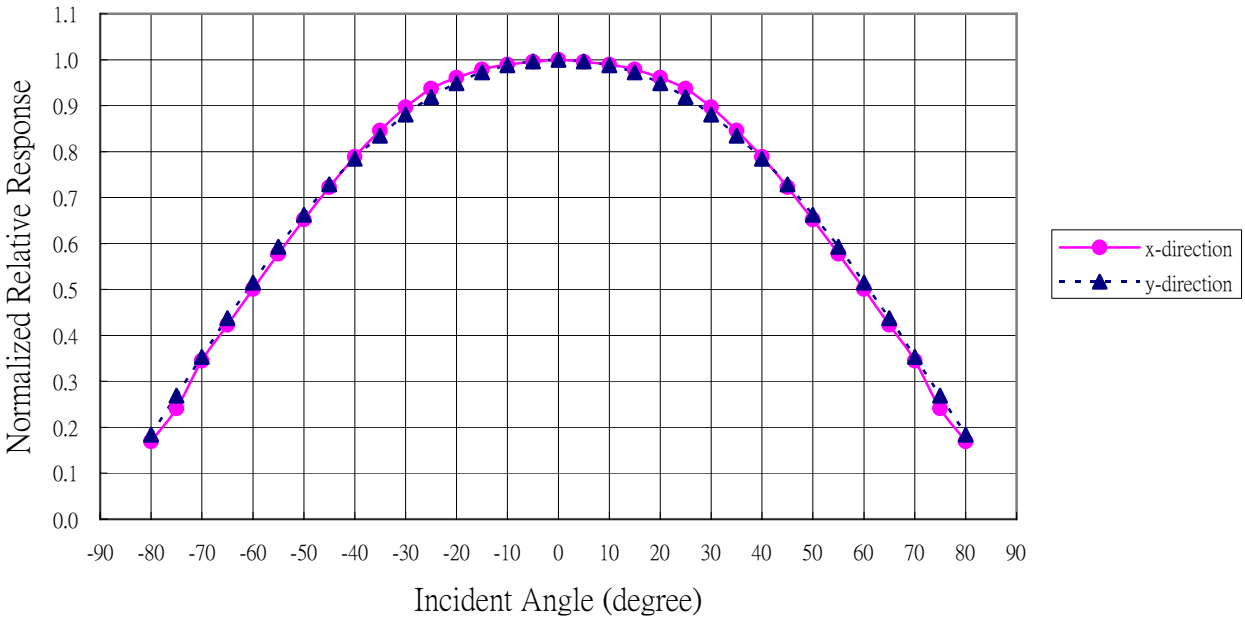
Spectral Response

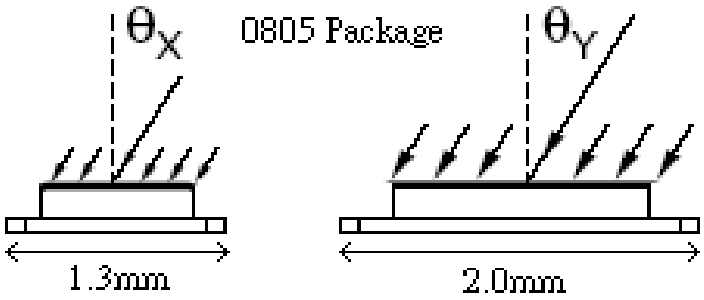


Relative V-Ta



Relative Response v.s. Incident Angle



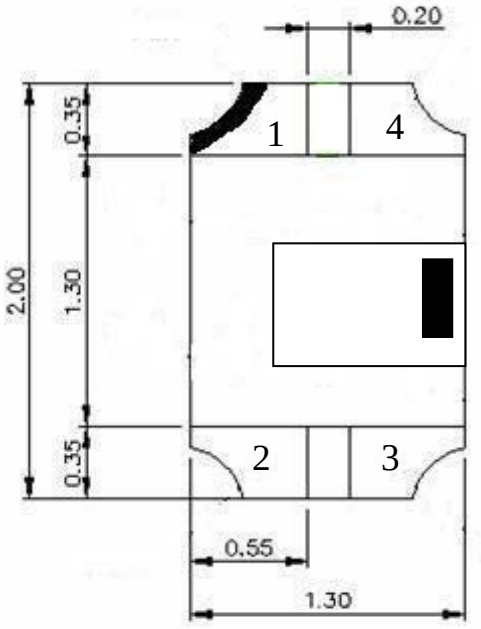


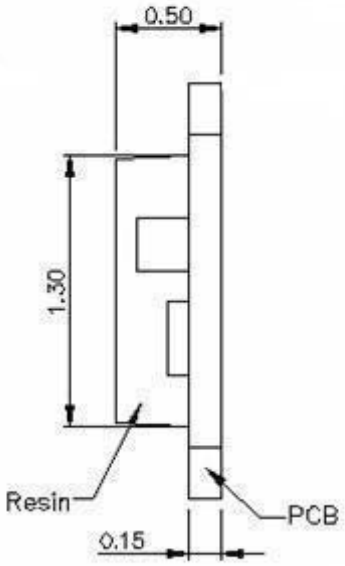
PAD DESCRIPTIONS

PAD NO.	PAD NAME	DESCRIPTIONS
1	VSS	Ground
2	OUT	Output
3	SD	Shut-down (High Active)
4	VDD	Power

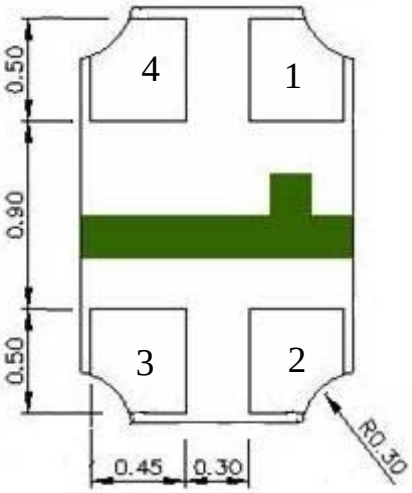
PACKAGE DESCRIPTIONS

TOP VIEW

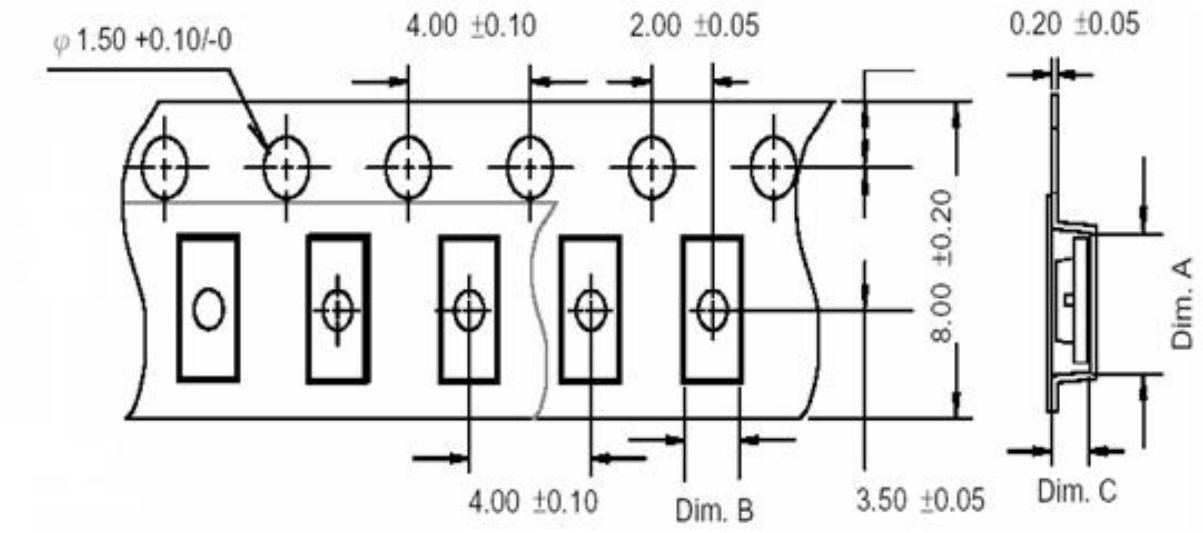




BOTTOM VIEW

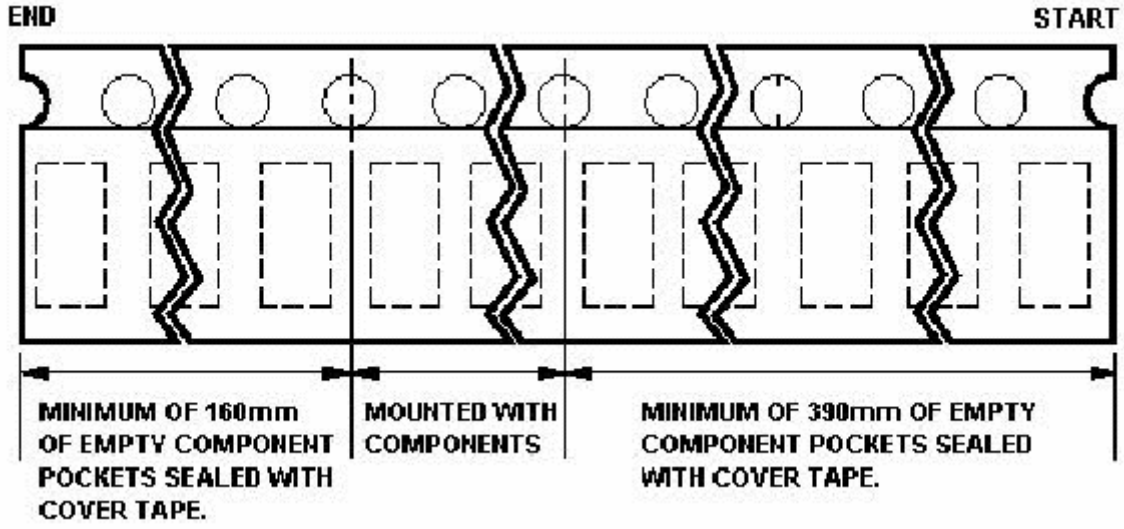


TAPE DIMENSION

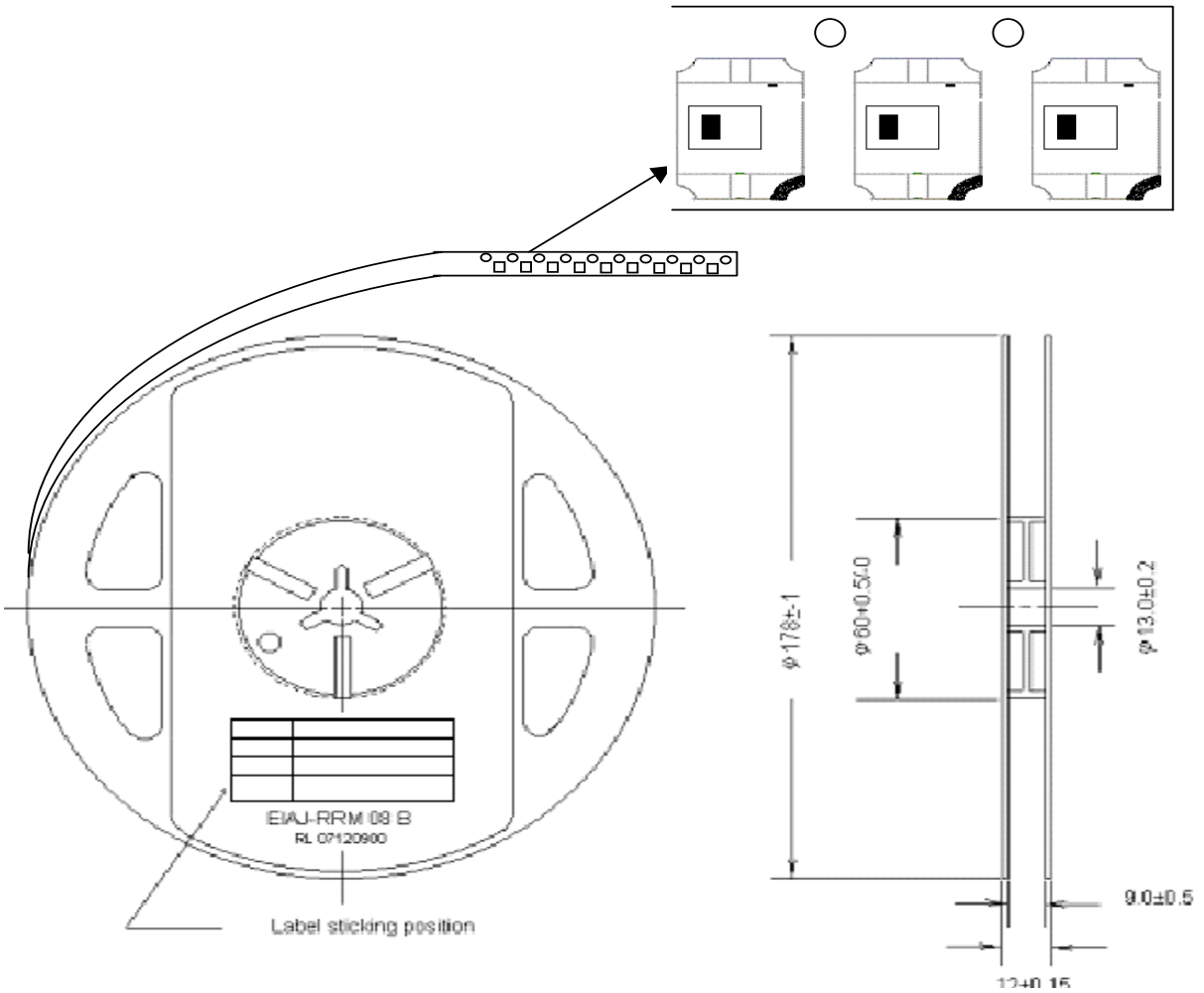


Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-372	2.24±0.10	1.37±0.10	0.74±0.10	2K

Unit: mm



REEL DIMENSION



REFLOW SOLDERING

(1) Recommend soldering paste specification:

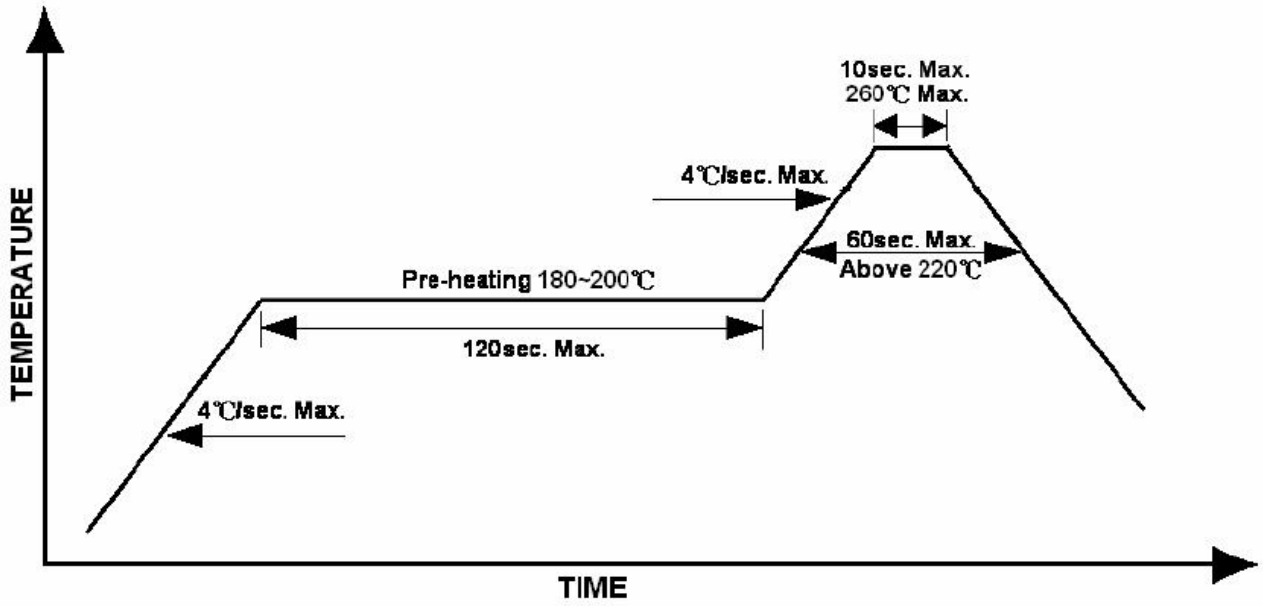
Operating temp.: Above 220℃, 60sec Max.

Peak temp.: 260℃, Max., 10sec Max.

(2)Never take next process until the component is cooled down to room temperature after reflow.

(3)The recommended reflow soldering profile is following:

Lead-free Solder



REWORK

(1) Customer must finish rework within 3 sec. under 350℃ .

(2) The head of iron cannot touch copper foil.

(3)Twin-head type is preferred.

The products listed herein are designed for ordinary electronic applications, such as electrical appliances, audio-visual equipment, communications devices and so on. Hence, it is advisable that the devices should not be used in medical instruments, surgical implants, aerospace machinery, nuclear power control systems, disaster/crime-prevention equipment and the like. Misusing those products may directly or indirectly endanger human life, or cause injury and property loss.

Silicon Touch Technology, Inc. will not take any responsibilities regarding the misusage of the products mentioned above. Anyone who purchases any products described herein with the above-mentioned intention or with such misused applications should accept full responsibility and indemnify. Silicon Touch Technology, Inc. and its distributors and all their officers and employees shall defend jointly and severally against any and all claims and litigation and all damages, cost and expenses associated with such intention and manipulation.