SA88010RS22-J00

Silicon PIN Infrared Photodiode

General Description

SA88010RS22-J00 is a PIN photodiode with high speed and high photo sensitivity in an optical SMD2015 package. The sensitive area of chip is 1 mm^2.

Features

- Package type: Optical SMD2015
- Dimensions: 2.0mmx1.5mmx0.6mm (LxWxH)
- Peak sensitivity occurs with 870nm wavelength
- Fast rising and falling speed
- AEC-Q102 Qualified

Applications

- Automotive sensors
- Industrial electronics

Absolute Maximum Ratings (T_A = +25°C)

Symbol	Parameter	Min	Max	Unit
T_{OP}	Operation temperature	-40	100	°C
T_{stg}	Storage temperature	-40	100	°C
V_R	Reverse voltage		20	V
ESD	Human Body Model	±2000		V

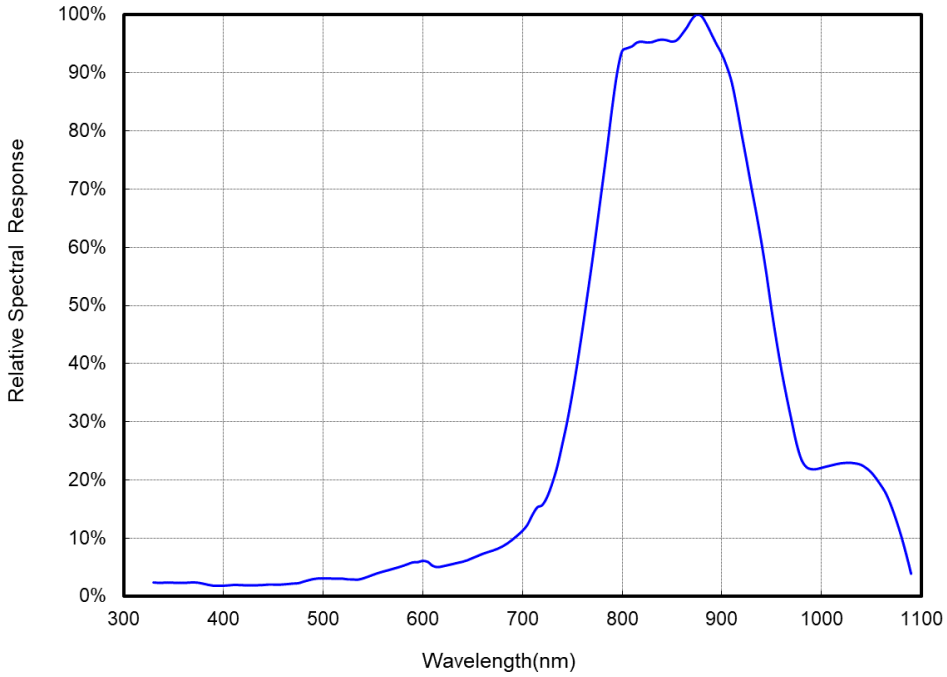
NOTE: *All parameters having Min/Max specifications are guaranteed. Typical values are for information purposes only. Unless otherwise noted, all tests are at the specified temperature and are pulsed tests, therefore:* $T_J = T_C = T_A$

Electrical and Optical Characteristics (T_A=+25°C, unless otherwise specified)

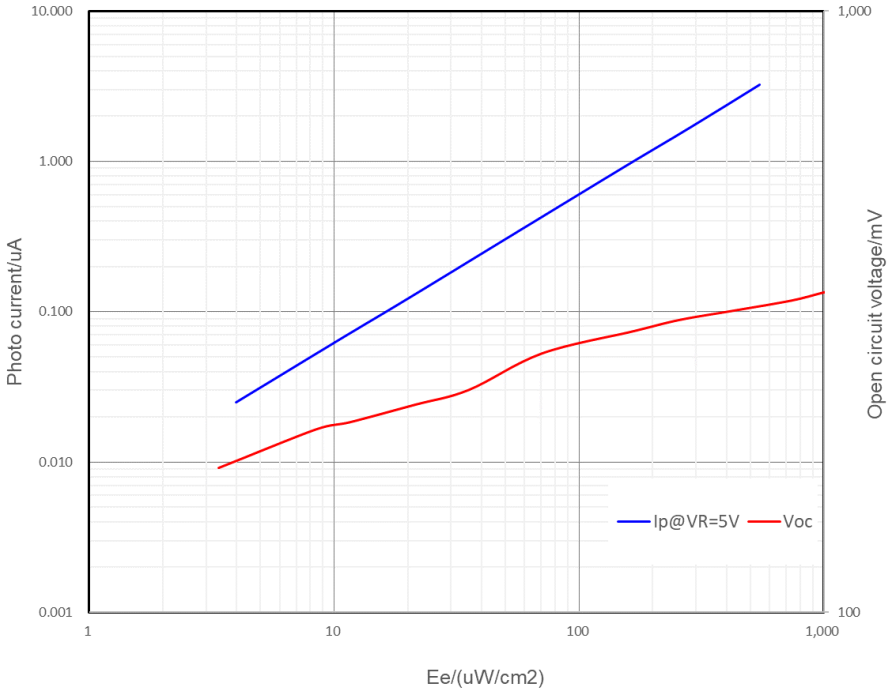
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I_P	Photo Current	V=5V, λ=850nm, Ee=1mW/cm^2	5.3	6.7	8.1	μA
λ_P	Wavelength of Peak Sensitivity			870		nm
$\lambda_{10\%}$	Spectral Range of Sensitivity		695		1080	nm
A	Radiant Sensitive Area			1.00		mm^2
LxW	Dimension of Sensitive Area			1.0x1.0		mm×mm
φ	Angle of Half Sensitivity			±55		degree
$V_{(BR)R}$	Reverse Breakdown Voltage	I_R=100uA, Ee=0mW/cm^2			20	V
I_D	Dark Current	V=5V, Ee=0mW/cm^2		1	15	nA
$S_{\lambda typ}$	Spectral Sensitivity of Chip	λ=850nm		0.67		A/W
η	Quantum Yield of Chip	λ=850nm		0.98		Electrons/Photo
V_{OC}	Open-circuit Voltage	λ=850nm,Ee=1mW/cm^2		340		mV
I_{SC}	Short-circuit Current	λ=850nm,Ee=1mW/cm^2		6.3		μA
V_F	Forward Voltage	E=0, I_F=80mA		1.2		V
Ct	Total Capacitance	V=0V, Ee=0mW/cm^2, f=1MHz		11		pF
TC_V	Temperature Coefficient of V_{OC}	λ=850nm		-3.1		mV/k
TC_I	Temperature Coefficient of I_{SC}	λ=850nm		-0.02		%/k

Typical Curves

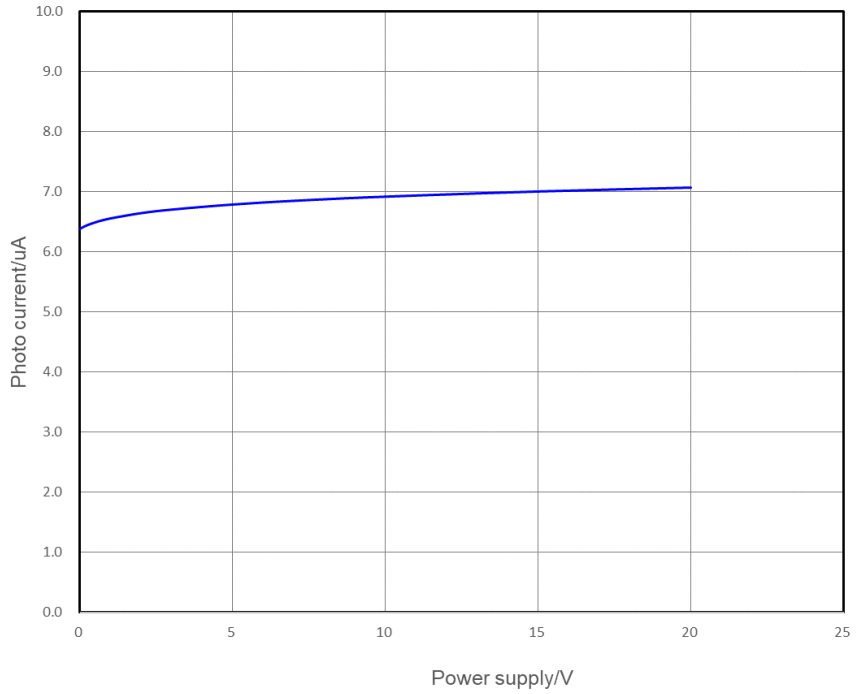
Relative Spectral Response



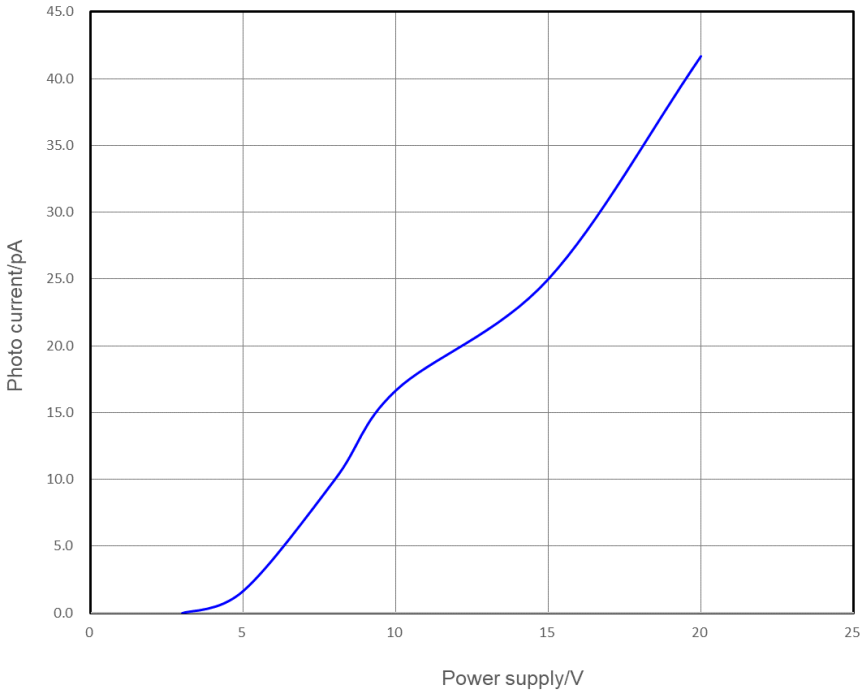
Light Current / Open-circuit Voltage vs. Ee



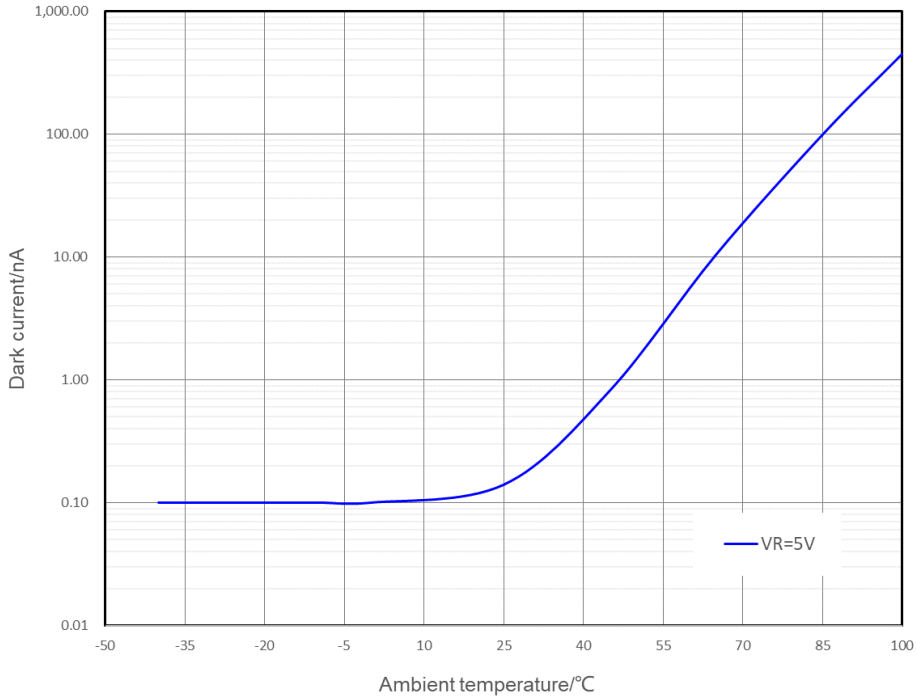
Light Current vs. Power Supply



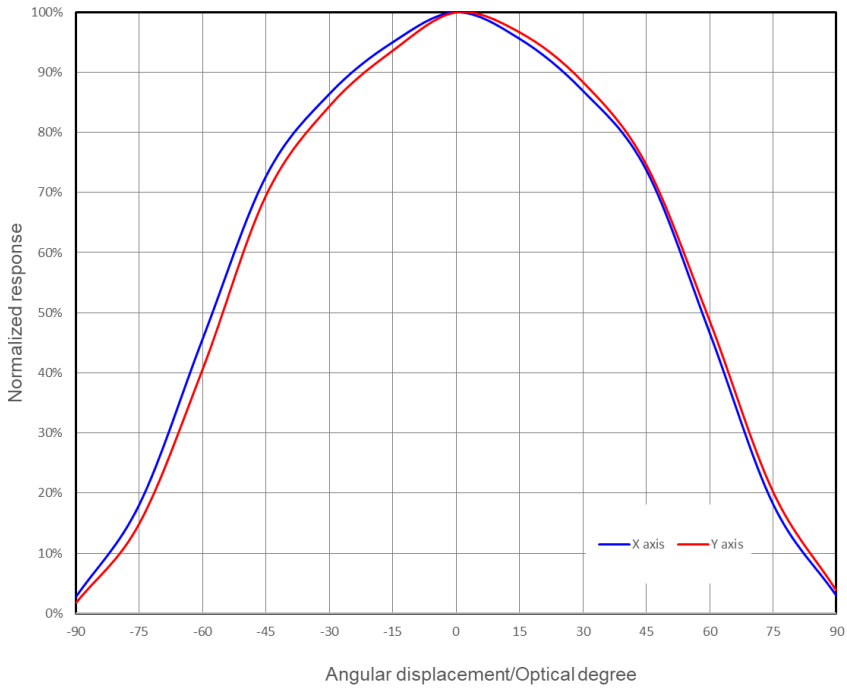
Dark Current vs. Power Supply



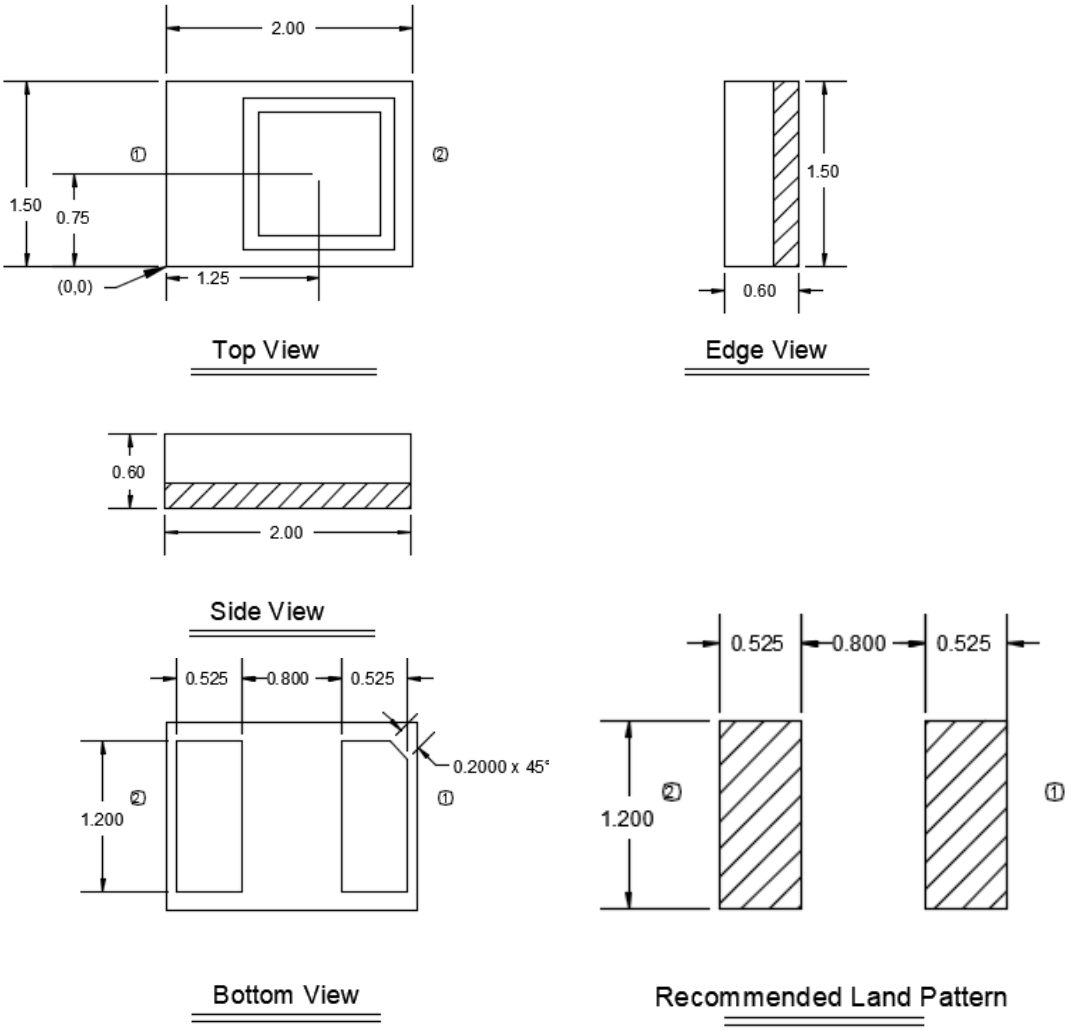
Dark Current vs. Ambient Temperature



Normalized Angular Response



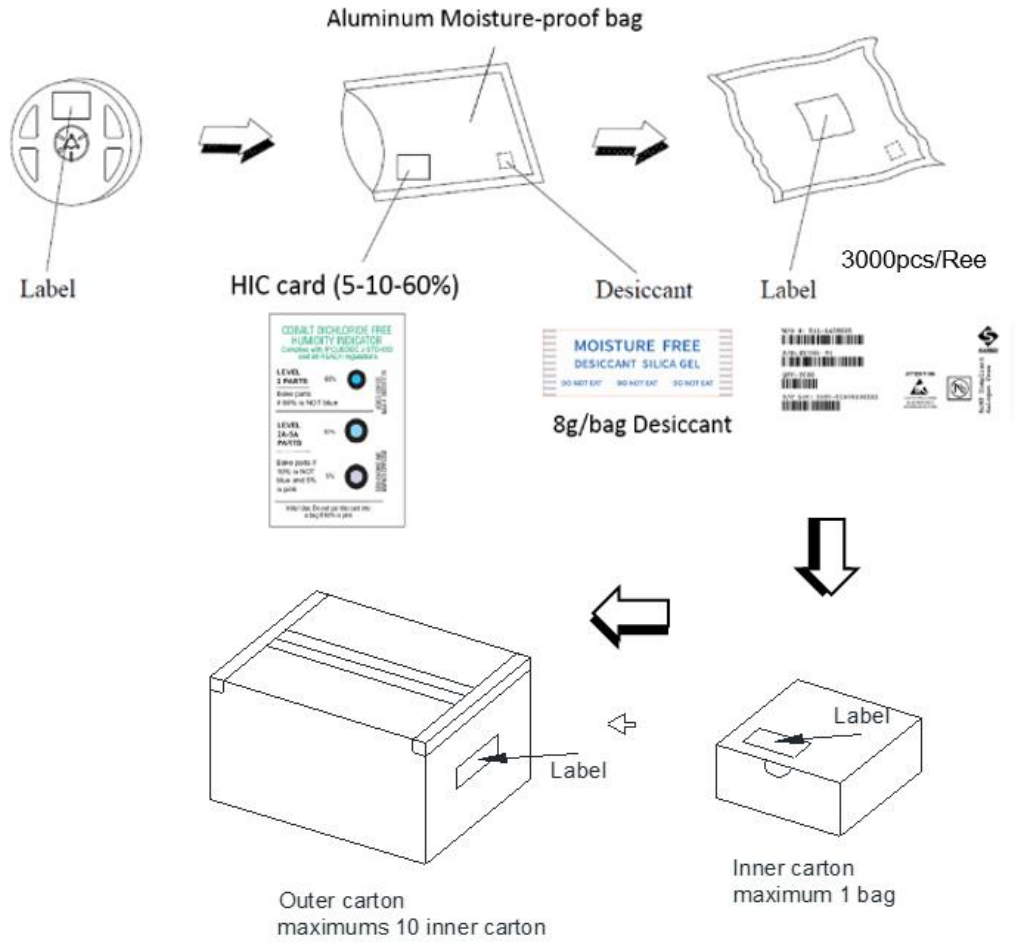
Package Outline Drawings



Pin name	Pin assignment
1	Anode
2	Cathode

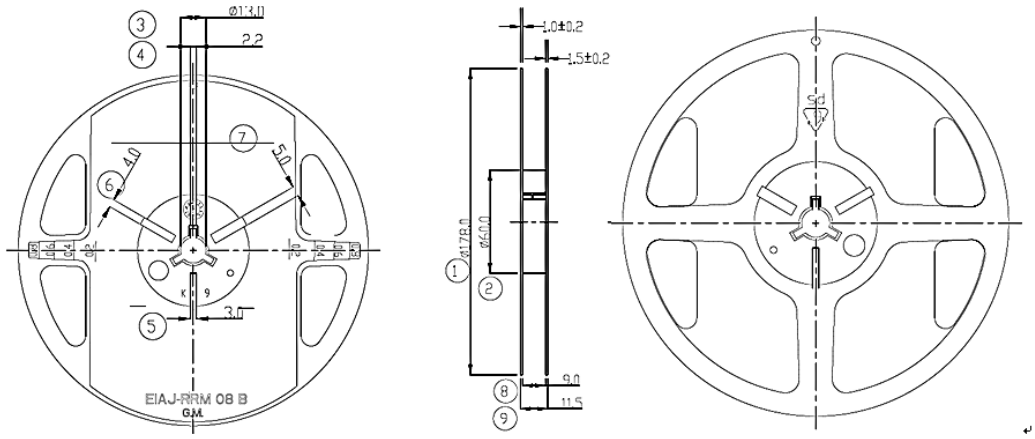
Note:
[1] All tolerances are +/-0.1mm, unless otherwise noted;
[2] ALS sensing center is at point A (x,y)=(1.25,0.75);
[3] Sensitive area: 1.0mm x 1.0mm;
[4] Unit is mm.

Packaging Quantity Specifications

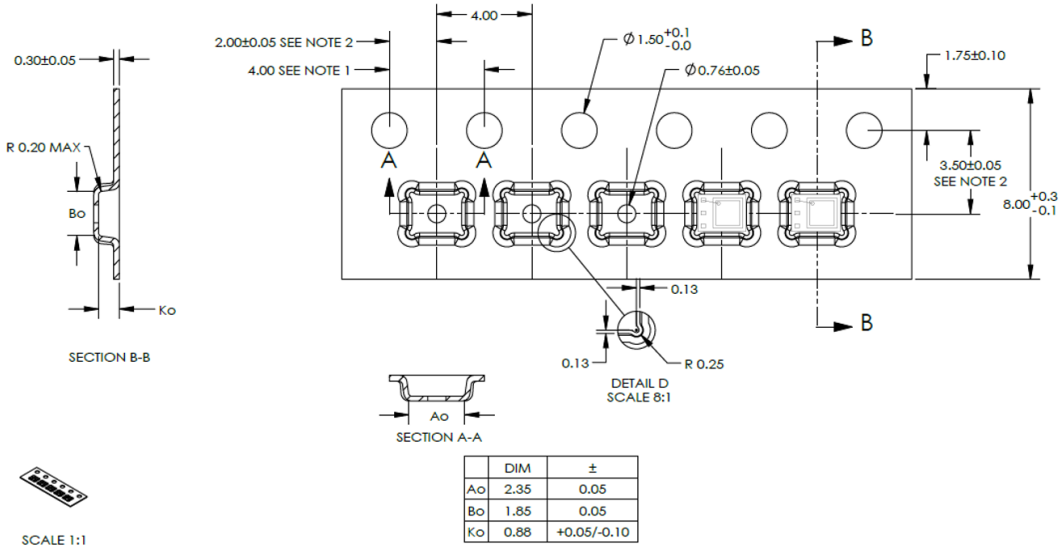


● Dimensions of Reel (Unit: mm)

Width	1	2	3	4	5	6	7	8	9
7"	178±1	60±0.5	13±0.5	2.2±0.5	$3^{+0.5}_{-0}$	$4^{+0.5}_{-0}$	$5.0^{+0.5}_{-0}$	9±0.5	11.5±0.5



● Dimensions of Tape (Unit: mm)



	DIM	±
Ao	2.35	0.05
Bo	1.85	0.05
Ko	0.88	+0.05/-0.10

Recommended Method of Storage

Storage is recommended as soon as the bag has been opened to prevent moisture absorption. The following conditions should be observed, if bags are not available:

- Storage temperature: 10°C to 30°C
- Storage humidity: ≦60%RH max.
- Storage Time: ≦168hr max.

Moisture-Proof Package

To avoid moisture absorption by the resin, the product should be stored under the following conditions:

- Temperature: 23 ± 5°C
- Relative humidity: 60% (max)
- Baking is required if the devices have been stored unopened for more than 24 months and the HIC card is not discolored

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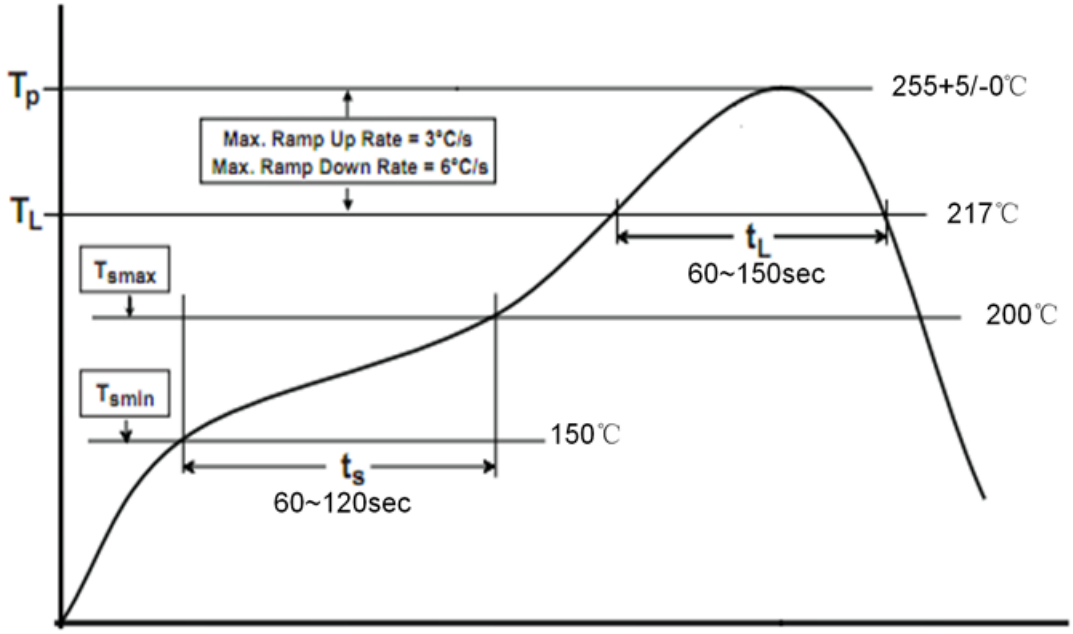
ESD Precaution

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the Anti-static bag. Electro-Static Sensitive Devices warning labels are on the packing.

Make any necessary soldering correction manually

Temperature shall be no more than 350°C (25W for soldering iron) within 3 seconds. Make sure do not do this more than one time for any given pin.

Recommended Solder Profile



Note:

[1]. Do not put stress on the devices during heating stage while soldering.

[2]. Do not warp the circuit board after soldering.

Revision History

The revision history provided is for informational purpose only and is believed to be accurate, however, not warranted. Please make sure that you have the latest revision.

Revision Number	Revision Date	Description
1.0	Nov 17,2024	Production Release
0.9B	Nov 17,2023	Add “AEC-Q102 Qualified” in Features
0.9A	Jun 1,2023	“Baking is required if the devices have been store unopened for more than six months” changed into “Baking is required if the devices have been stored unopened for more than 24 months and the HIC card is not discolored”.
0.9	Feb 27,2023	Initial Release

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