

Technical Data Sheet

Chip Phototransistor With Right Angle Lens

PT12-21B/TR8

Features

- Fast response time
- High photo sensitivity
- Small junction capacitance



Descriptions

PT12-21B/TR8 is a phototransistor in miniature SMD package molded in a black plastic with right angle lens. The spectrally device is matched to infrared emitting diode.

Applications

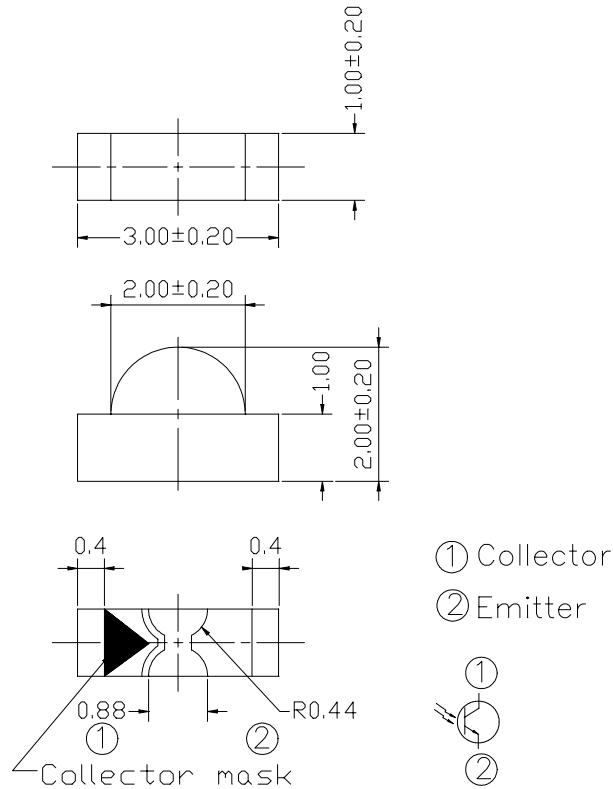
- Optoelectronic switch
- VCR , Video , Camera
- Infrared applied system

Device Selection Guide

LED Part No.	Chip	Lens Color
	Material	
PT	Silicon	Black

Device No:DTT-012-079

Package Dimensions



- Notes:**
- 1.All dimensions are in millimeters
 - 2.Tolerances unless dimensions ± 0.1 mm

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector-Voltage	V_{ECO}	5	V
Collector Current	I_C	50	mA
Operating Temperature	T_{opr}	-25 ~ +85°C	°C
Storage Temperature	T_{stg}	-40 ~ +85°C	°C
Lead Soldering Temperature	T_{sol}	260	°C
Power Dissipation at (or below) 25°C Free Air Temperature	P_c	75	mW

Notes: *1:Soldering time ≤ 5 seconds.

Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Collector – Emitter Breakdown Voltage	BV_{CEO}	$I_C=100\ \mu A$ $E_e=0mW/cm^2$	30	---	---	V
Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_E=100\ \mu A$ $E_e=0mW/cm^2$	5	---	---	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=2mA$ $E_e=1mW/cm^2$	---	---	0.4	V
Rise Time	t_r	$V_{CE}=5V$ $I_C=1mA$	---	15	---	μS
Fall Time	t_f	$RL=1000\ \Omega$	---	15	---	
Collector Dark Current	I_{CEO}	$E_e=0mW/cm^2$ $V_{CE}=20V$	---	---	100	nA
On State Collector Current	$I_{C(on)}$	$E_e=1mW/cm^2$ $V_{CE}=5V$	0.3	1.14	---	mA
Wavelength of Peak Sensitivity	λ_p	---	---	940	---	nm
Rang of Spectral Bandwidth	$\lambda_{0.5}$	---	---	730-1100	---	nm

Typical Electro-Optical Characteristics Curves

Fig.1 Collector Power Dissipation vs. Ambient Temperature

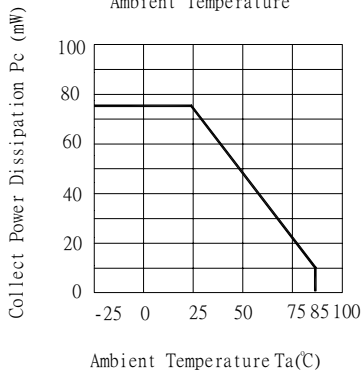


Fig.2 Collector Dark Current vs. Ambient Temperature

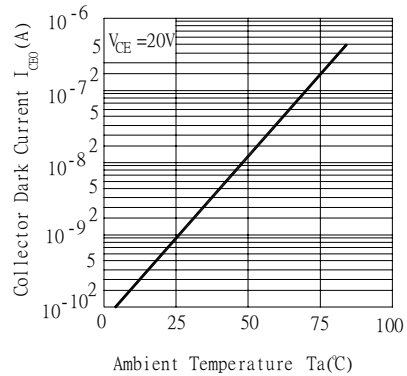


Fig. 3 Relative Collector Current vs. Ambient Temperature

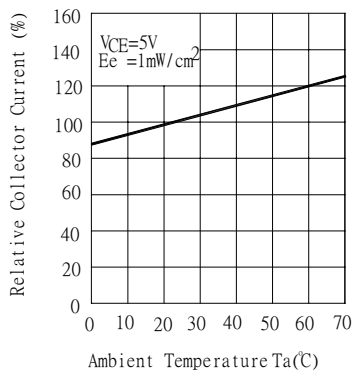


Fig.4 Collector Current vs. Irradiance

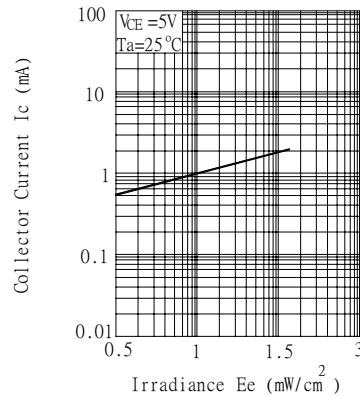


Fig.5 Spectral Sensitivity

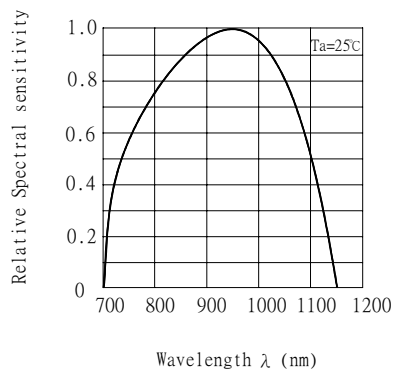
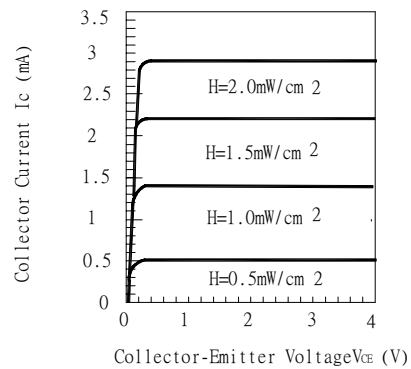
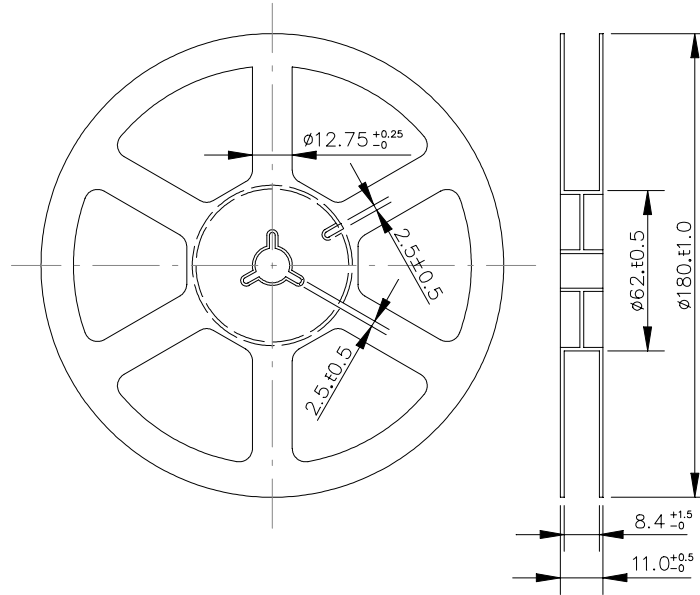


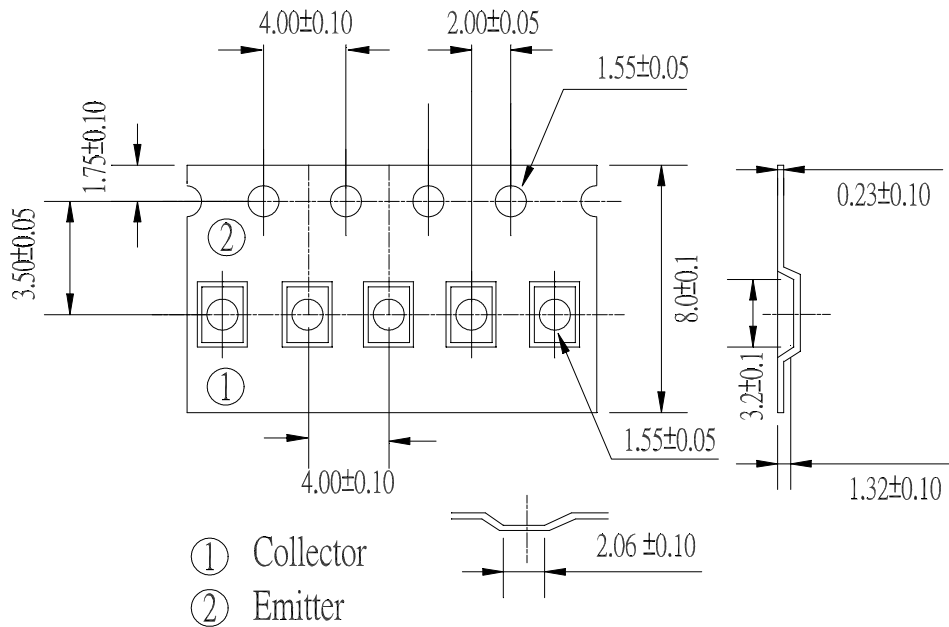
Fig.6 Collector Current vs. Collector-Emitter Voltage



Package Dimensions



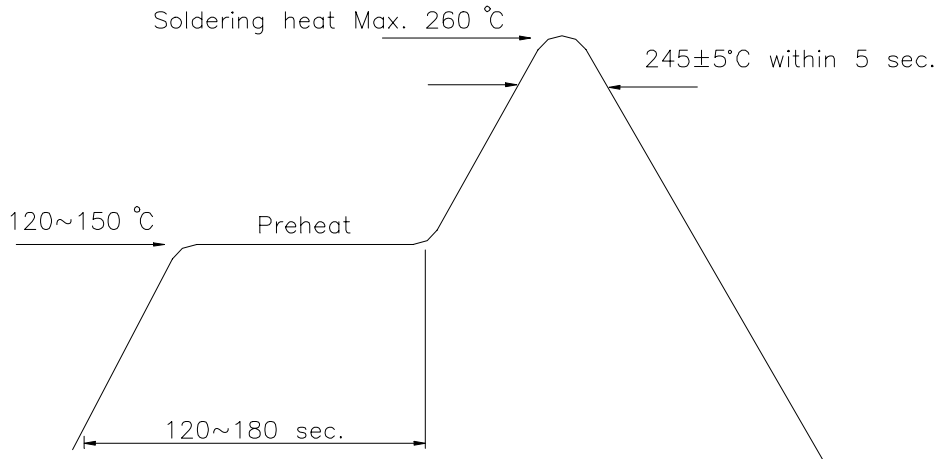
Loaded Quantity Per Reel 2000PCS/Reel



Unit : mm

Soldering heat reliability(DIP)

Please refer to the following figure

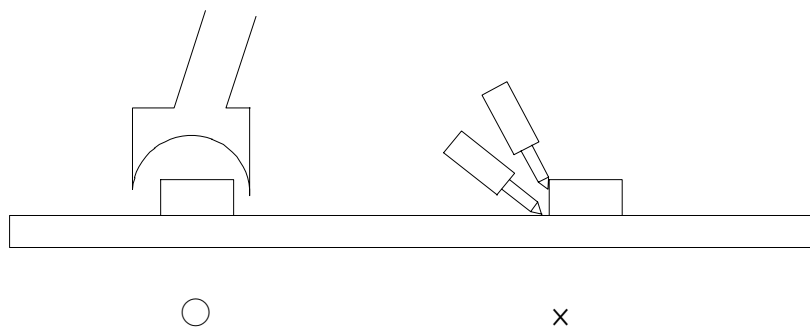


Soldering Iron

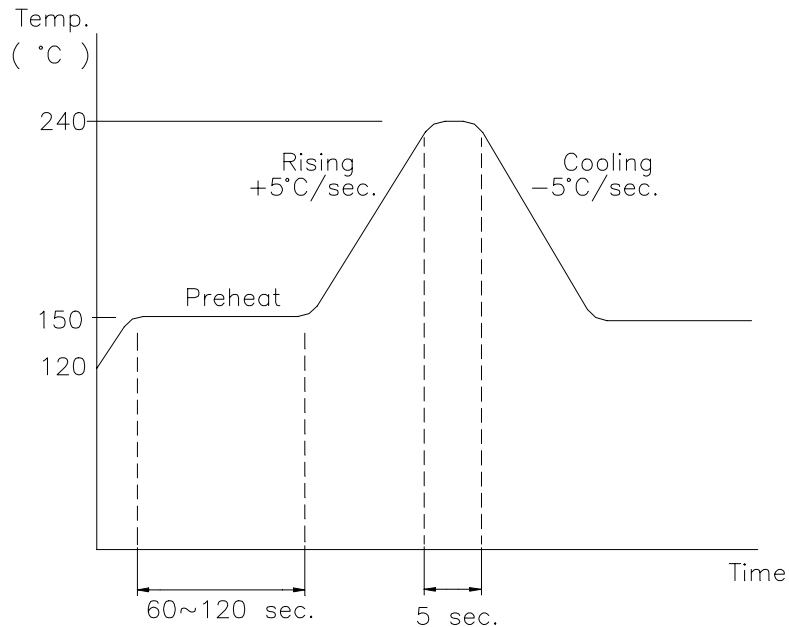
Basic spec is ≤ 5 sec when 260°C . If temperature is higher, time should be shorter ($+10^{\circ}\text{C} \rightarrow -1$ sec). Power dissipation of Iron should be smaller than 15W , and temperature should be controllable. Surface temperature of the device should be under 230°C .

Rework

- 1.Customer must finish rework within 5 sec under 245°C .
- 2.The head of iron can not touch copper foil.
- 3.Twin-head type is preferred.



Reflow Temp./Time



Precautions For Use

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 The operation of temperature and R.H are : 5°C~35°C , R.H.60%.

2.2 Once the package is opened, the products should be used within a week.

Otherwise, they should be kept in a damp proof box with desiccating agent.

Considering the tape life, we suggest our customers to use our products within a year (from production date).

2.3 If opened more than one week in an atmosphere 5°C~35°C , R.H.60%, they should be treated at 60°C ± 5°C for 15hrs.

2.4 When you discover that the desiccant in the package has a pink color (normal=blue), you should treat them in the same conditions as 2.3

Reliability Test Item And Condition

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

Confidence level : 90%

LTPD : 10%

NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	REFLOW	TEMP. : 240°C ± 5°C 5secs	6mins	22pcs	More than 90% of lead to be covered by soldering	0/1
2	Temperature Cycle	H : +85°C 30mins ↑↓ 5mins L : -55°C 30mins	50Cycles	22pcs	$I_R \geq U \times 2$ $E_e \leq L \times 0.8$	0/1
3	Thermal Shock	H : +100°C 5mins ↑↓ 10secs L : -10°C 5mins	50Cycles	22pcs	$V_F \geq U \times 1.2$ U : Upper	0/1
4	High Temperature Storage	TEMP. : +100°C	1000hrs	22pcs	Specification Limit	0/1
5	Low Temperature Storage	TEMP. : -55°C	1000hrs	22pcs	L : Lower Specification	0/1
6	DC Operating Life	$V_{CE}=5V$	1000hrs	22pcs	Limit	0/1
7	High Temperature/ High Humidity	85°C / 85% R.H	1000hrs	22pcs		0/1

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Device No: DTT-012-079

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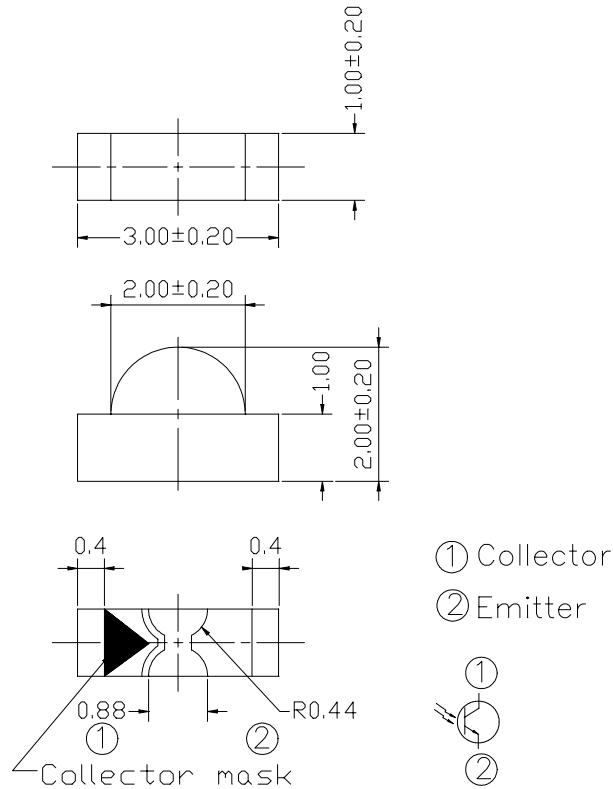
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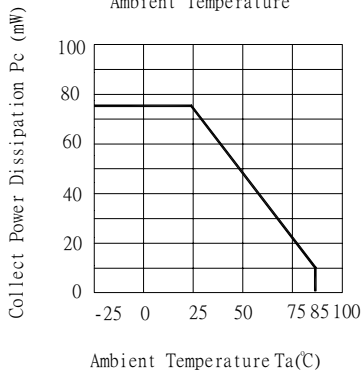


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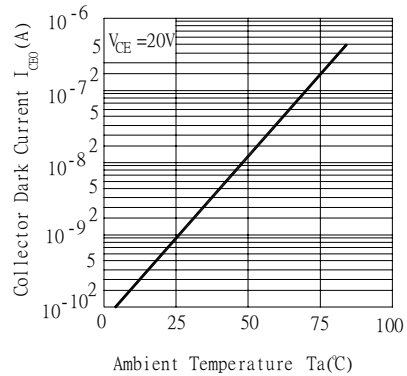


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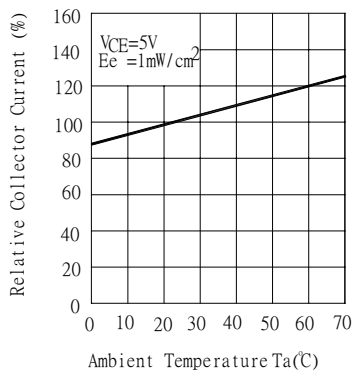


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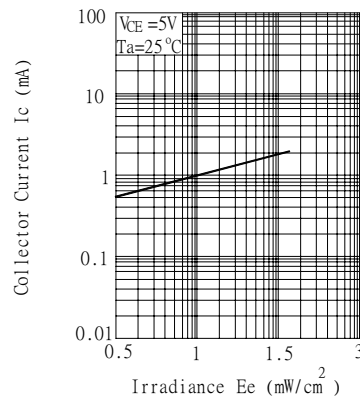


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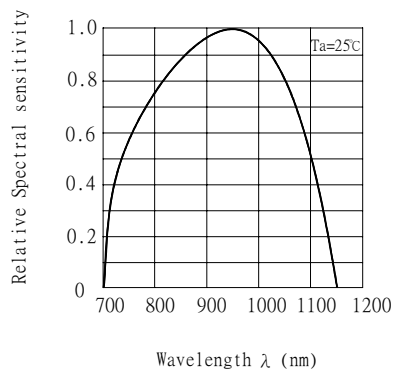
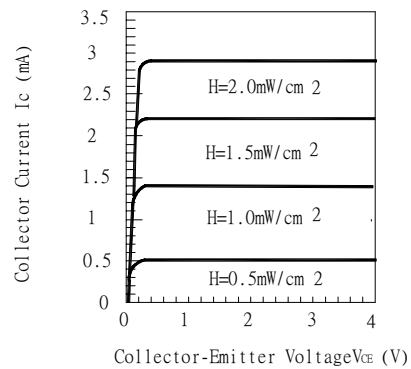
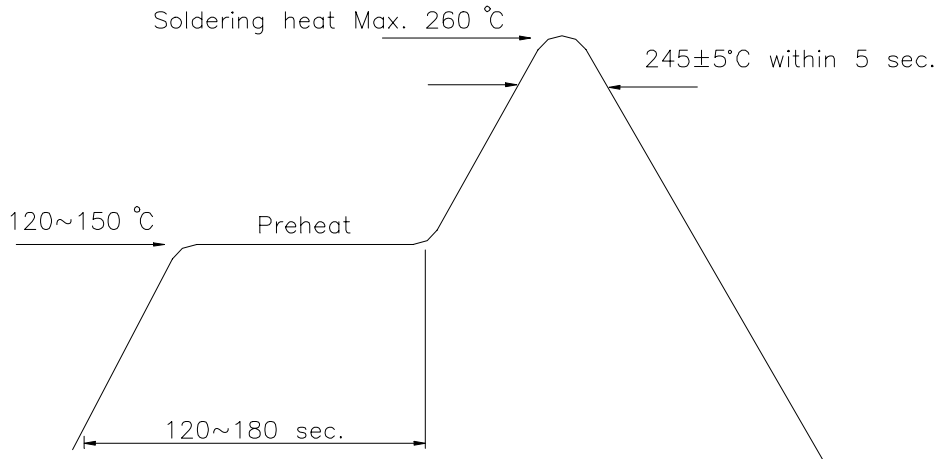


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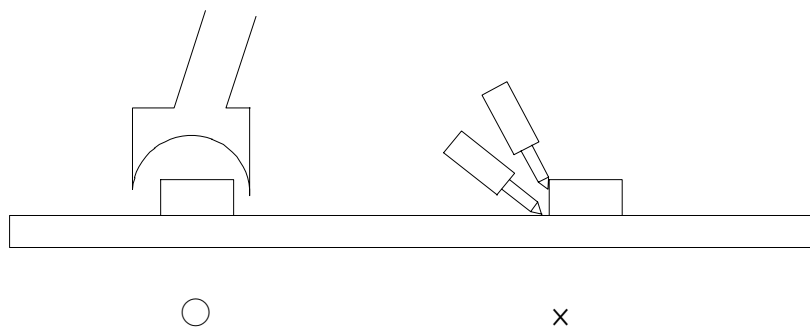


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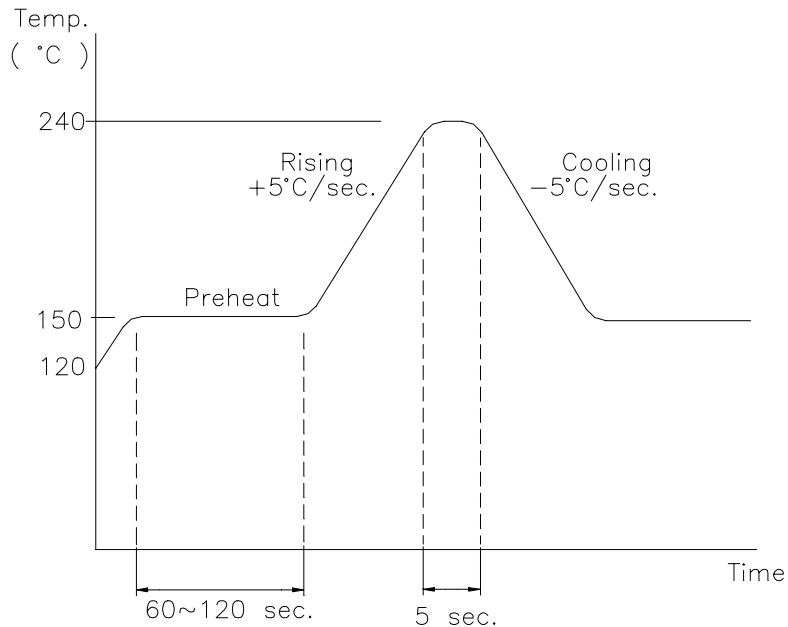
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