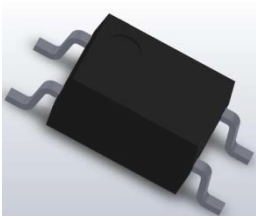


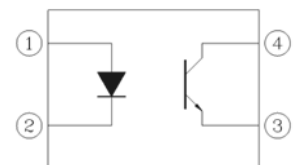
4 PIN SOP PHOTOTRANSISTOR PHOTOCOUPLER EL121N Series



Features:

- Halogens free
(Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm)
- Current transfer ratio
(CTR: 50~400% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output (Viso=3750 V rms)
- Compact 4 Pin SOP with a 2.0 mm profile
- Compliance with EU REACH.
- Pb free and RoHS compliant.
- UL and cUL approved(No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved

Schematic



Pin Configuration

1. Anode
2. Cathode
3. Emitter
4. Collector

Description

The EL121N series contains an infrared emitting diode, optically coupled to a phototransistor detector. The devices in a 4-pin small outline SMD package.

Applications

- DC-DC Converters
- Programmable controllers
- Telecommunication equipments
- Signal transmission between circuits of different potentials and impedances

Absolute Maximum Ratings (T_a=25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I _F	50	mA
	Peak forward current (1 us, pulse)	I _{FP}	1	A
	Reverse voltage	V _R	6	V
	Power dissipation Derating factor (about T _a =100°C)	P _D	70	mW
			2.9	mW/°C
Output	Power dissipation Derating factor (above T _a = 70°C)	P _C	150	mW
			3.7	mW/°C
	Collector current	I _C	50	mA
	Collector-Emitter voltage	V _{CEO}	80	V
	Emitter-Collector voltage	V _{ECO}	7	V
	Total Power Dissipation	P _{TOT}	200	mW
Isolation Voltage*1	V _{ISO}	3750	V rms	
Operating temperature	T _{OPR}	-55 ~ +110	°C	
Storage temperature	T _{STG}	-55 ~ +125	°C	
Soldering Temperature*2	T _{SOL}	260	°C	

Notes:

*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

*2 For 10 seconds

Electro-Optical Characteristics (T_a=25°C unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	V _F	-	1.2	1.4	V	I _F = 20mA
Reverse current	I _R	-	-	10	μA	V _R = 4V
Input capacitance	C _{in}	-	30	250	pF	V = 0, f = 1kHz

Note: Reverse Voltage(V_R) Condition is applied to I_R test only The device is not designed for reverse operation

Output

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Collector-Emitter dark current	I _{CEO}	-	-	100	nA	V _{CE} = 20V, I _F = 0mA
Collector-Emitter breakdown voltage	BV _{CEO}	80	-	-	V	I _C = 0.1mA
Emitter-Collector breakdown voltage	BV _{ECO}	7	-	-	V	I _E = 0.01mA

Transfer Characteristics (T_a=25°C unless specified otherwise)

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer ratio	EL121N	50	-	400	%	I _F = 5mA, V _{CE} = 5V
	EL121N B	130	-	260		
	EL121N C	200	-	400		
	EL121N BC	130	-	400		
Collector-Emitter saturation voltage	V _{CE(sat)}	-	0.1	0.2	V	I _F = 20mA, I _C = 1mA
Isolation resistance	R _{IO}	5×10 ¹⁰	-	-	Ω	V _{IO} = 500Vdc, 40~60% R.H.
Floating capacitance	C _{IO}	-	0.6	1.0	pF	V _{IO} = 0, f = 1MHz
Rise time	t _r	-	6	18	μs	V _{CE} = 2V, I _C = 2mA, R _L = 100Ω
Fall time	t _f	-	8	18		

* Typical values at T_a = 25°C

Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs Forward Voltage

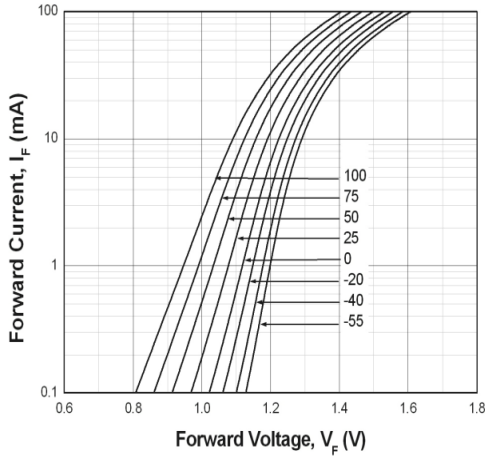


Figure 2. Normalized Collector Current vs Forward Current

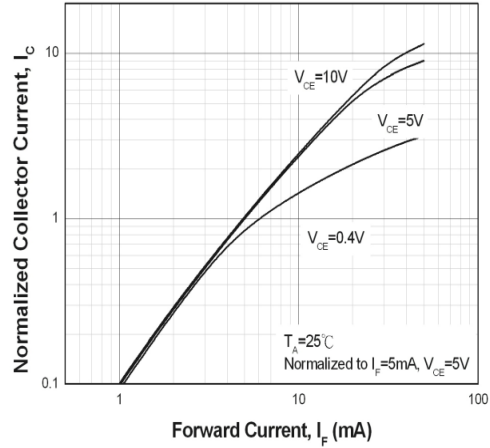


Figure 3. Normalized Current Transfer Ratio vs Forward Current

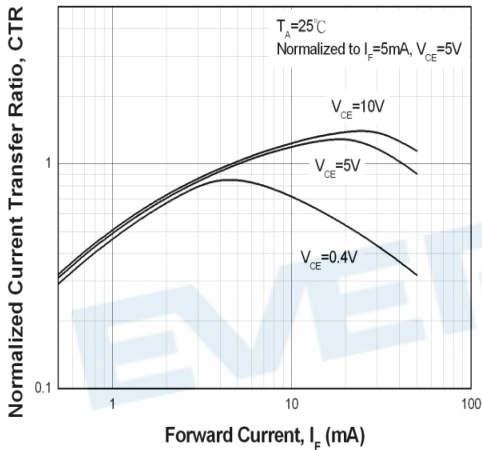


Figure 4. Normalized Collector Current vs Ambient Temperature

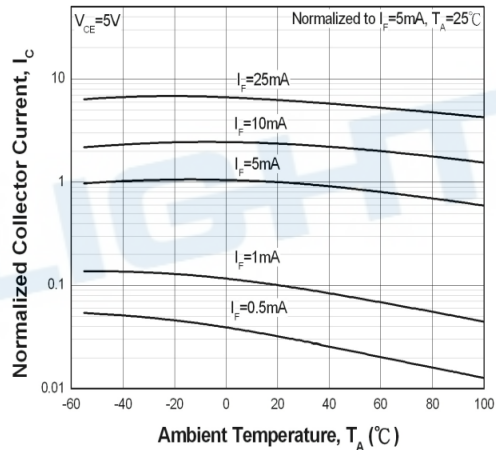


Figure 5. Collector Current vs Collector-Emitter Voltage

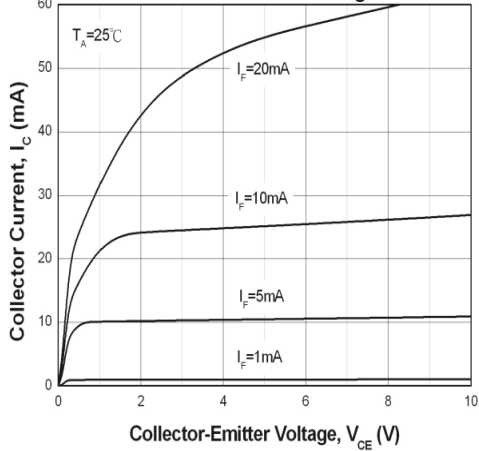


Figure 6. Collector Current vs Collector-Emitter Voltage

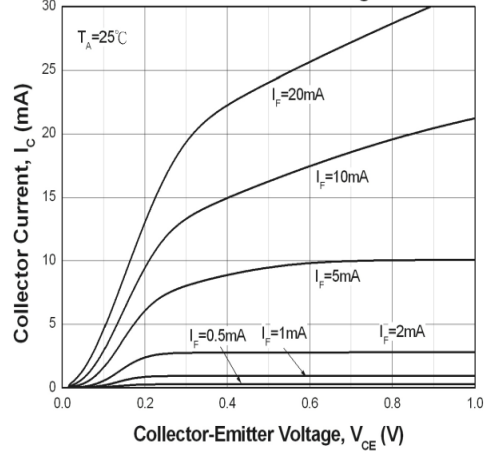


Figure 7. Collector Dark Current vs Ambient Temperature

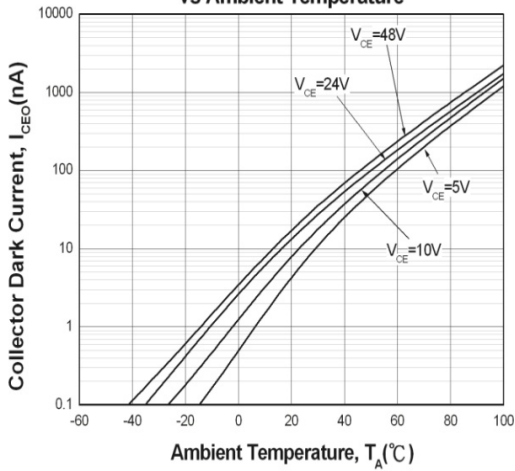


Figure 8. Switching Time vs Load Resistance

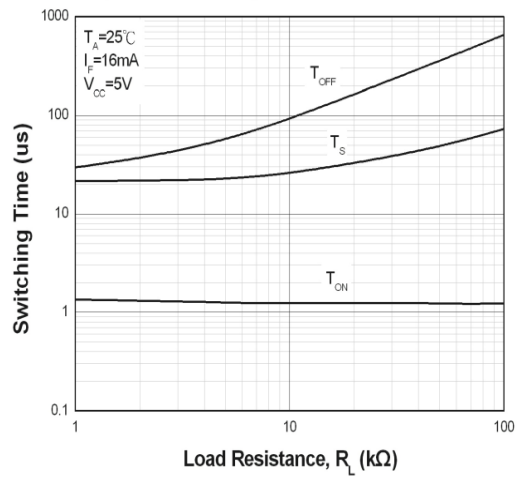


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

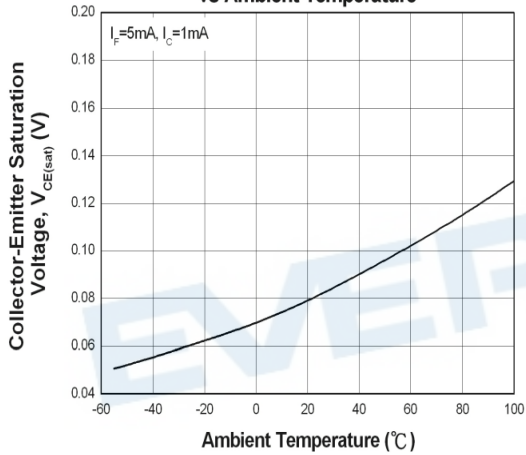
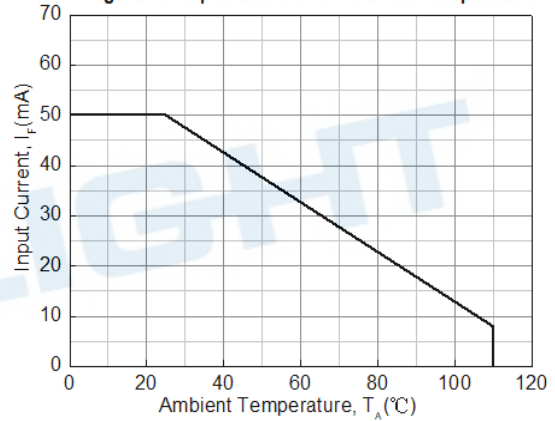
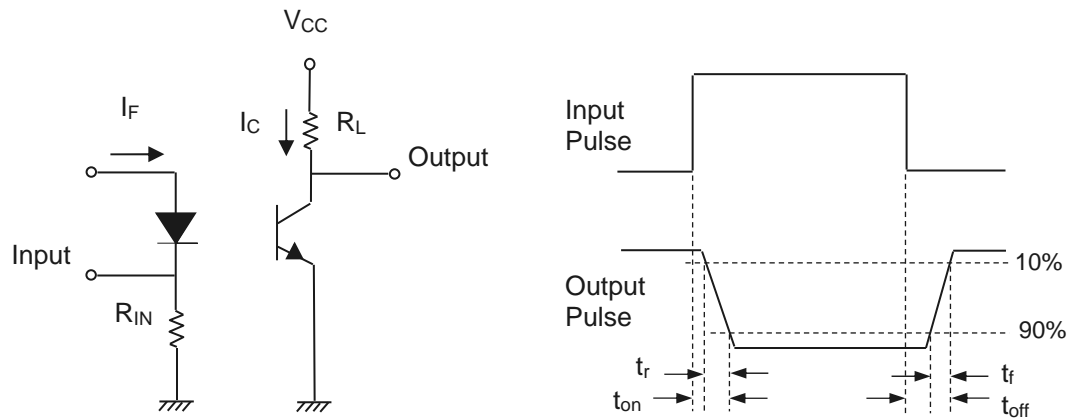


Figure 10. Input Current vs Ambient Temperature



Note: The graphs shown in this datasheet are representing typical data only and do not show guaranteed values

Figure 11. Switching Time Test Circuit & Waveforms



Order Information

Part Number

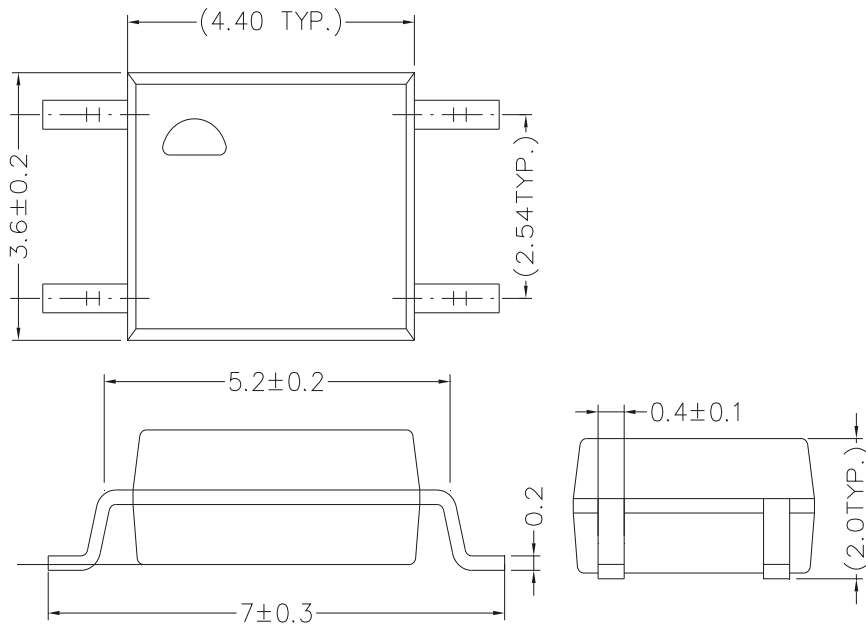
EL121N(X)(Y)-V

Note

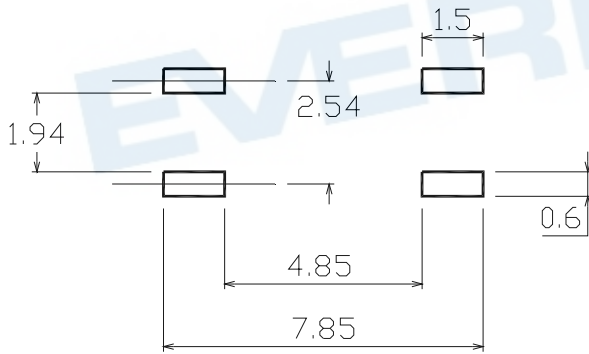
- X = CTR Rank (B, C, BC or none)
- Y = Tape and reel option (TA or TB).
- V = VDE

Option	Description	Packing quantity
(TA)	TA Tape & reel option	3000 units per reel
(TB)	TB Tape & reel option	3000 units per reel
(TA)-V	TA Tape & reel option + VDE	3000 units per reel
(TB)-V	TB Tape & reel option + VDE	3000 units per reel

Package Dimension (Dimensions in mm)



Recommended pad layout for surface mount leadform



Device Marking





Notes


EL	denotes Everlight
121N	denotes Device Number
R	denotes CTR Rank (B, C, BC or none)
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE

EVERLIGHT


Label form


EVERLIGHT
11 → 月份



客戶料號 ← CPN: XXXXXXXXXXXX 測試區
  → RoHS標示

億光料號 ← P/N: XXXXXXXXXXXX
  → 安規標示

億光品名 ← EL817M(C)-VG




生產周別 ← D/C: YWWX CAT: X QTY: 000000



  → 包裝數量

 REF: XXXX

生產序號 ← LOT NO: Y151130XXXXXXXXXX



標籤識別碼 ← REFERENCE: BTPyyMMddXXXXX



 → QR Code

產地 ← MADE IN XXXXXX

or

RoHS 標示


EVERLIGHT
5 → 月份


客戶料號 ← CPN: XXXXXXXXXXXX 測試區
  → 安規標示

客戶品名 ← XXXXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX



億光料號 ← P/N: XXXXXXXXXXXX

億光品名 ← XXXXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX


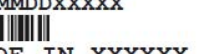
生產序號 ← LOT NO: Y150516XXX-XXXXXXXXXX-XXXXXXXXXX





包裝數量 ← QTY: 0123456789 HUE: XXXXXXXXXXXX

CTR等級 ← CAT: XXXXXXXXXXXX REF: XXXXXXXXXXXX

標籤識別碼 ← REFERENCE: BTPYMMDDXXXXX

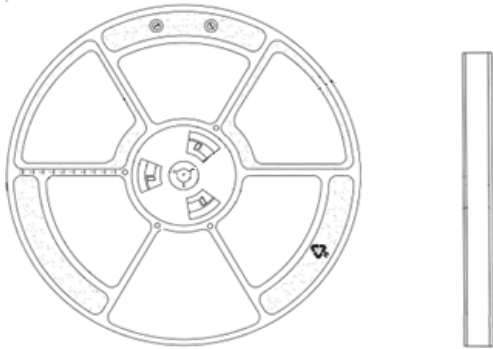

 → QR Code

MSL等級 ← MSL-XX MADE IN XXXXXX

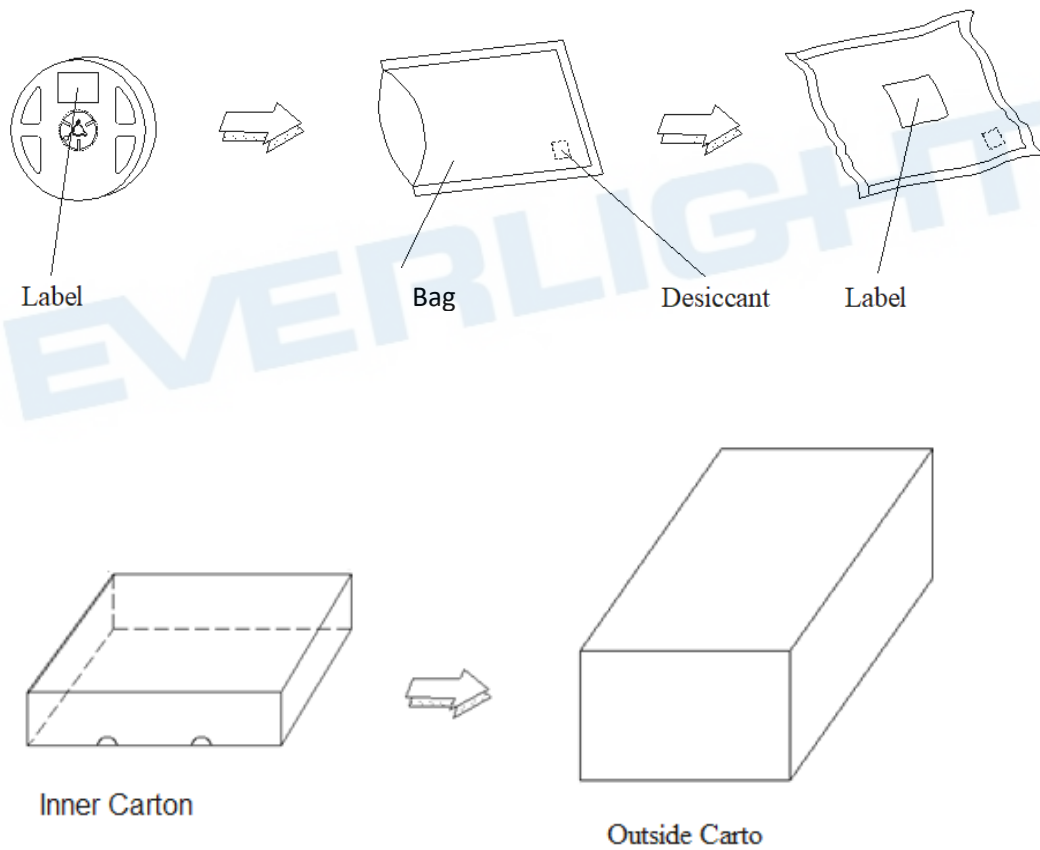
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 產地

Reel Dimension

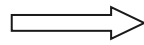
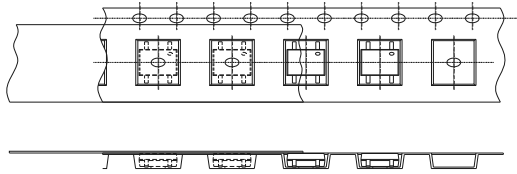


Moisture Resistant Packaging



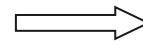
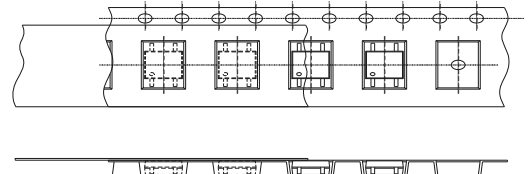
Tape & Reel Packing Specifications

Option TA



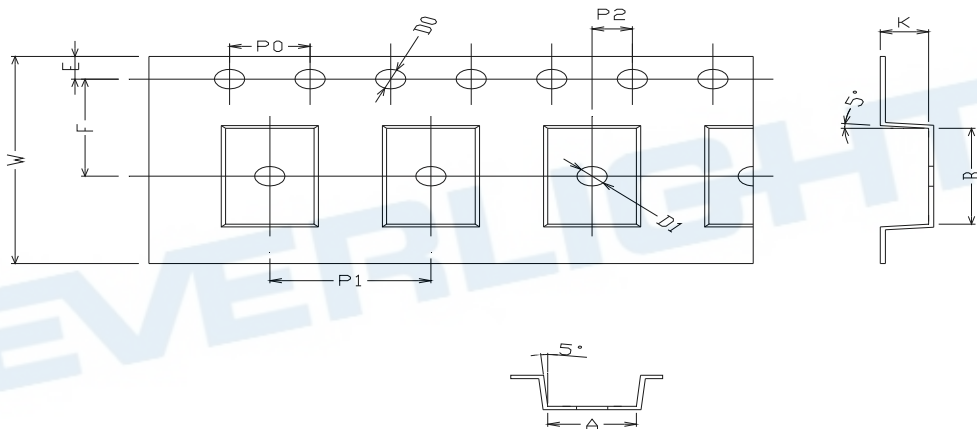
Direction of feed from reel

Option TB



Direction of feed from reel

Tape dimensions



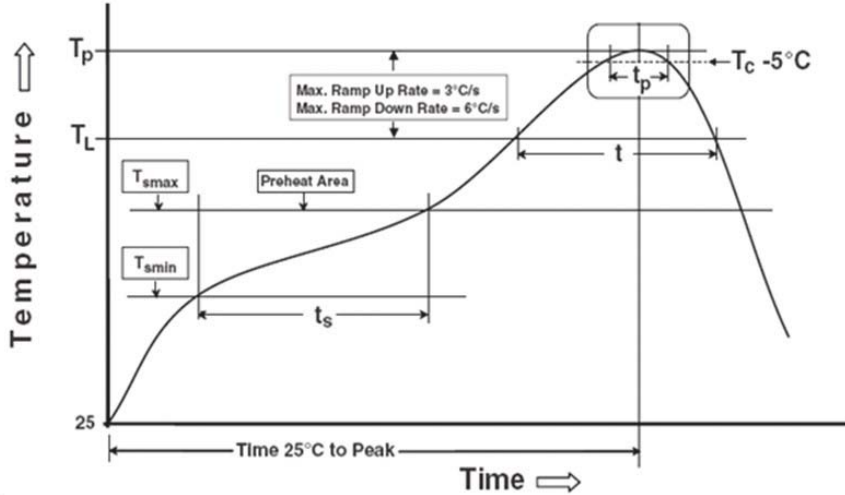
Tape dimensions

Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	4.1 ± 0.1	7.6 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	7.5 ± 0.05
Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0 ± 0.05	8.0 ± 0.1	2.0 ± 0.05	0.25 ± 0.05	16.0 ± 0.2	2.4 ± 0.1

Precautions for Use

1. Soldering Condition

1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Note:

Reference: IPC/JEDEC J-STD-020D

Preheat

Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max

Other

Liquidus Temperature (T_L)	217 °C
Time above Liquidus Temperature (t_L)	60-100 sec
Peak Temperature (T_p)	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	3 times

Precautions for General Storage

- Avoid storage locations where devices may be exposed to moisture or direct sunlight.
- Follow the precautions printed on the packing label of the device for transportation and storage.
- Keep the storage location temperature and humidity within a range of 5°C to 35°C and 20 % to 60 %, respectively.
- Do not store the products in locations with poisonous gases (especially corrosive gases) or in dusty conditions.
- Store the products in locations with minimal temperature fluctuations. Rapid temperature changes during storage can cause condensation, resulting in lead oxidation or corrosion, which will deteriorate the solderability of the leads.
- When restoring devices after removal from their packing, use anti-static containers.
- Do not allow loads to be applied directly to devices while they are in storage.
- If devices have been stored for more than two years under normal storage conditions, it is recommended that you check the leads for ease of soldering prior to use.

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