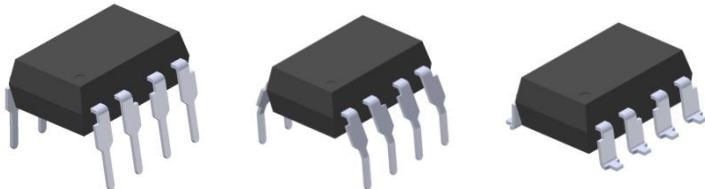
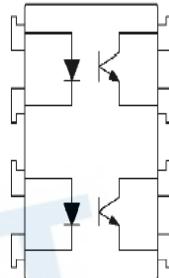


8 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLED EL827 Series



Schematic



Pin Configuration

- 1, 3. Anode
- 2, 4. Cathode
- 5, 7. Emitter
- 6, 8. Collector

Features:

- Current transfer ratio (CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output ($V_{iso} = 5000\text{ V rms}$)
- Compact small outline package
- The product itself will remain within RoHS compliant version
- Compliance with EU REACH
- UL and cUL approved(No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved

Description

The EL827series devices each of consist of an infrared emitting diodes, optically coupled to a phototransistor detector.

They are packaged in a 8-pin DIP package and available in wide-lead spacing and SMD option.

Applications

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as fan heaters, etc.
- Signal transmission between circuits of different potentials and impedances

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I _F	60	mA
	Peak forward current (1us, pulse)	I _{FP}	1	A
	Reverse voltage	V _R	6	V
	Power dissipation	P _D	100	mW
Output	Power dissipation	P _C	150	mW
	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}	5000	V rms
Operating temperature		T _{OPR}	-55 to 110	°C
Storage temperature		T _{STG}	-55 to 125	°C
Soldering temperature ^{*2}		T _{SOL}	260	°C

Notes:

^{*1}1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 & 3, 4 are shorted together, and pins 5, 6 & 7, 8 are shorted together.

^{*2} For 10 seconds

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

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward Voltage	V_F	-	1.2	1.4	V	$I_F = 20\text{mA}$
Reverse Current	I_R	-	-	10	μA	$V_R = 4\text{V}$
Input capacitance	C_{in}	-	30	250	pF	$V = 0, f = 1\text{kHz}$

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Collector-Emitter dark current	I_{CEO}	-	-	100	nA	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	BV_{CEO}	80	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	BV_{ECO}	7	-	-	V	$I_E = 0.1\text{mA}$

Transfer Characteristics

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer ratio	CTR	50	-	600	%	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$
Collector-Emitter saturation voltage	$V_{CE(\text{sat})}$	-	0.1	0.2	V	$I_F = 20\text{mA}, I_C = 1\text{mA}$
Isolation resistance	R_{IO}	5×10^{10}	-	-	Ω	$V_{IO} = 500\text{Vdc}, 40\text{--}60\% \text{ R.H.}$
Floating capacitance	C_{IO}	-	0.6	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$
Cut-off frequency	f_c	-	80	-	kHz	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega, -3\text{dB}$
Rise time	t_r	-	3	18	μs	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$
Fall time	t_f	-	4	18	μs	

* Typical values at $T_a = 25^\circ\text{C}$

Typical Electro-Optical Characteristics Curves

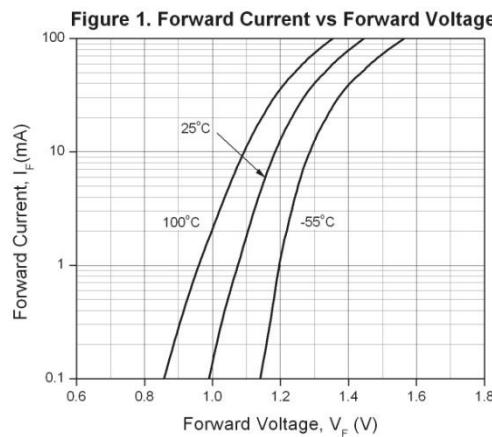


Figure 2. Normalized Collector Current vs Forward Current

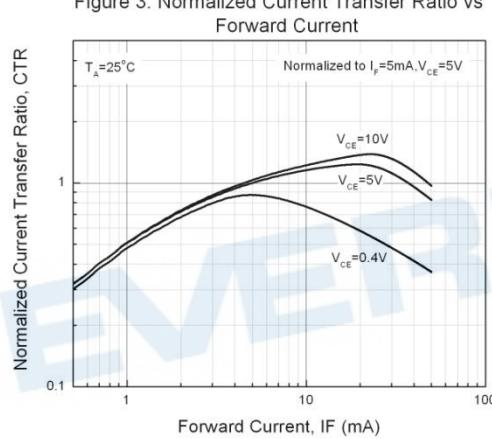
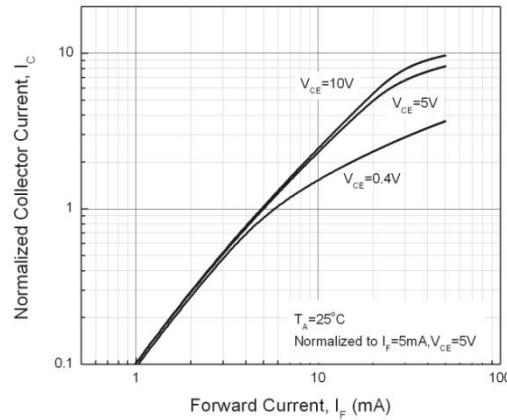


Figure 4. Normalized Collector Current vs Ambient Temperature

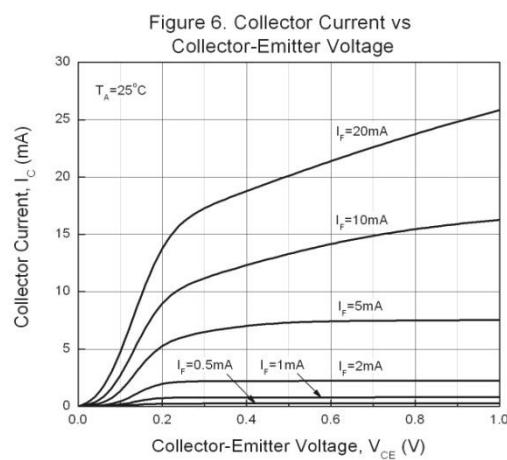
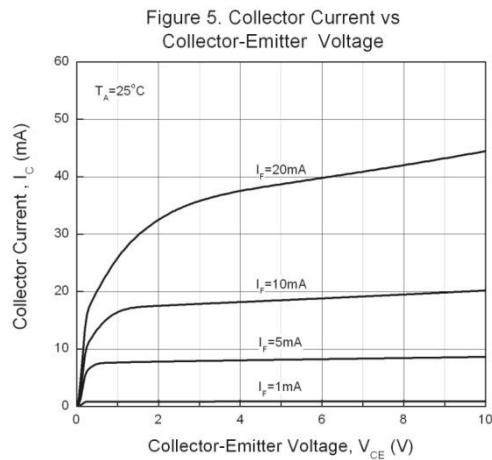
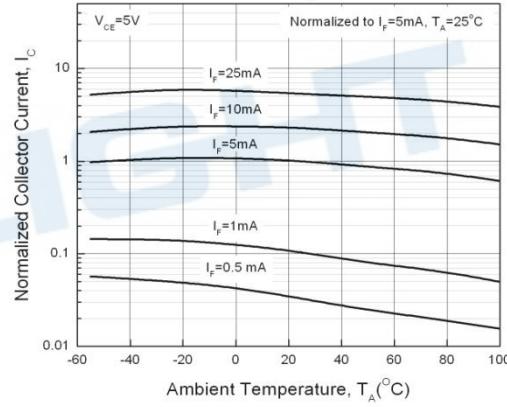


Figure 7. Collector Dark Current vs Ambient Temperature

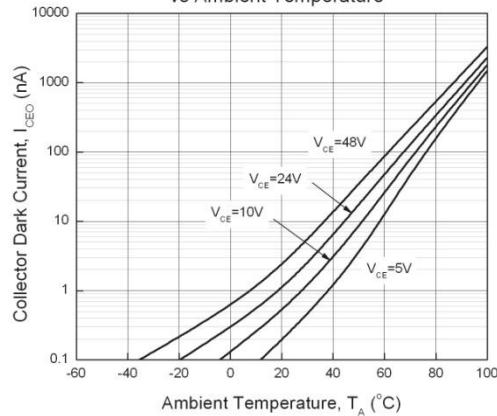


Figure 8. Switching Time vs Load Resistance

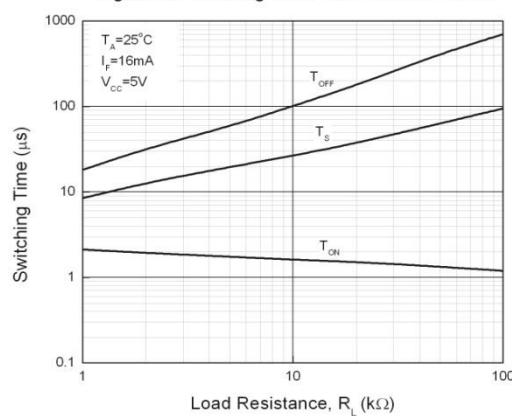


Figure 9. Collector-Emitter Saturation Voltage vs Ambient Temperature

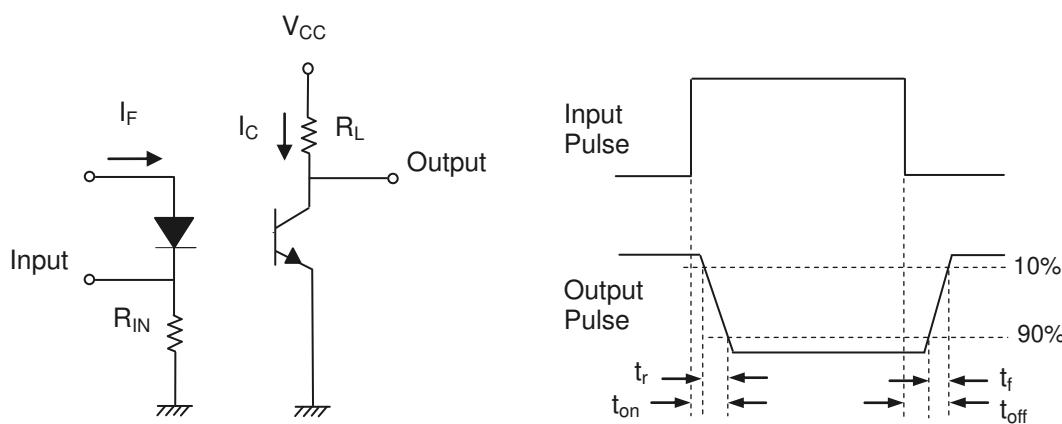
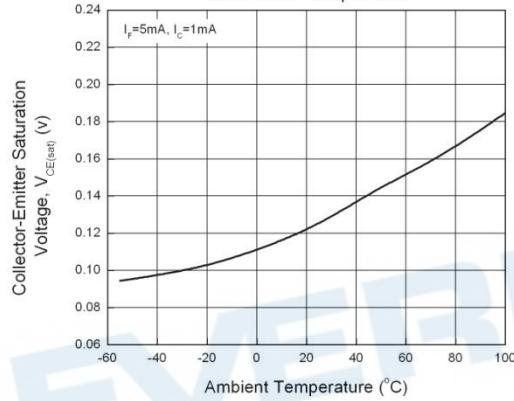


Figure 10. Switching Time Test Circuit & Waveforms

Order Information

Part Number

EL827X(Z)-V

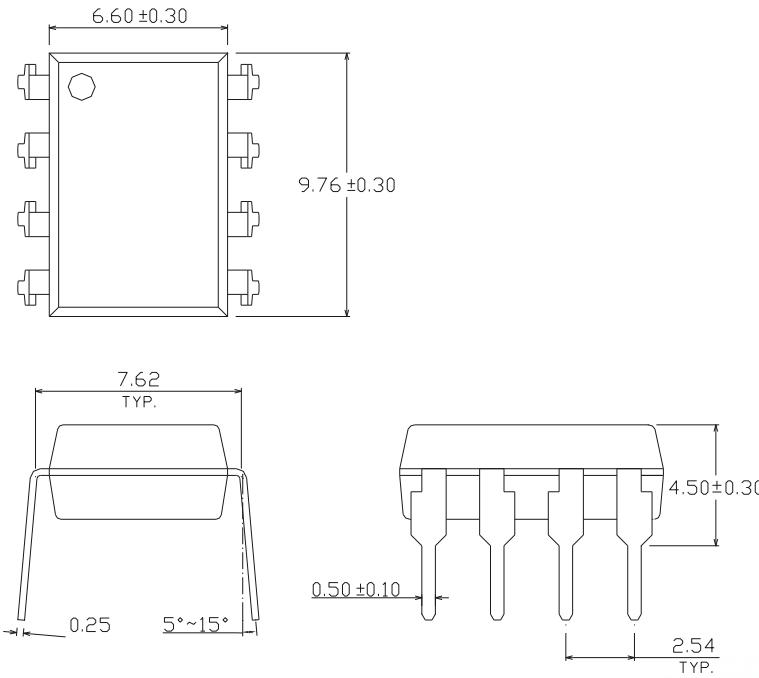
Note

X = Lead form option (S, S1, M or none)
Z = Tape and reel option (TA, TB or none)
V = VDE safety (optional)

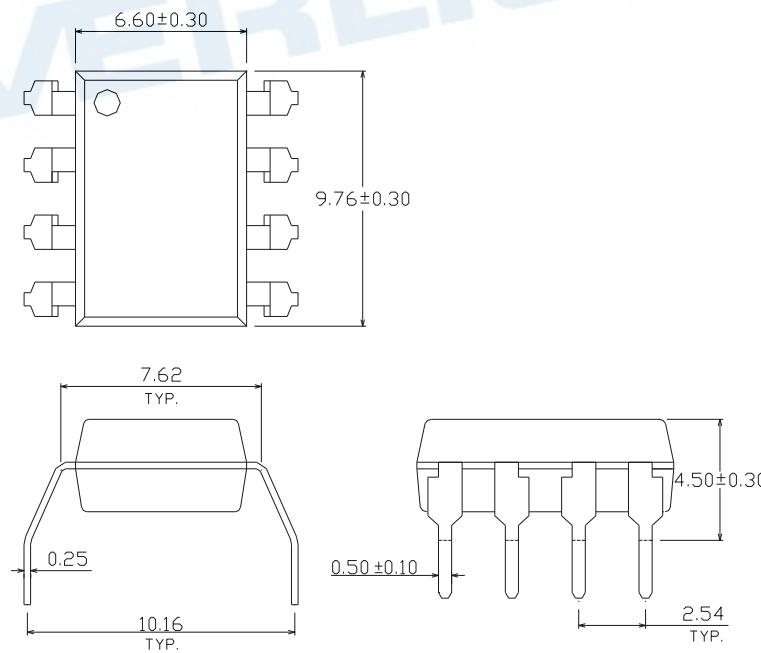
Option	Description	Packing quantity
None	Standard DIP-8	45 units per tube
M	Wide lead bend (0.4 inch spacing)	45 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S1 (TB)	Surface mount lead form (low profile) + TB tape & reel option	1000 units per reel

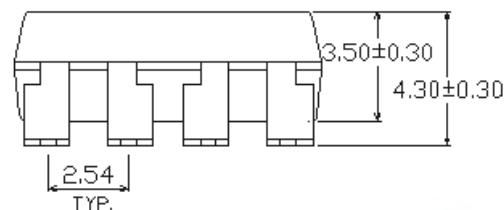
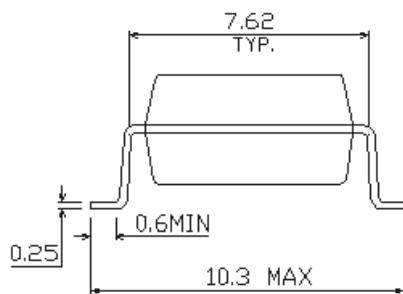
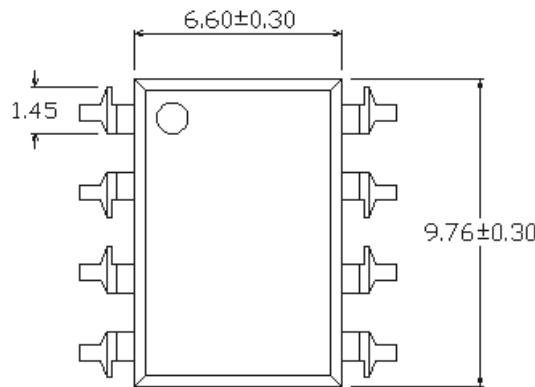
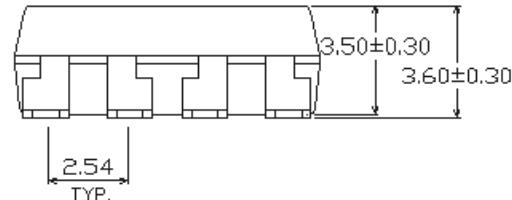
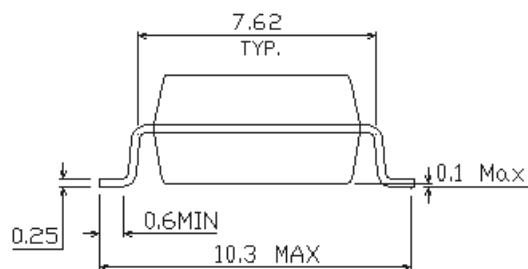
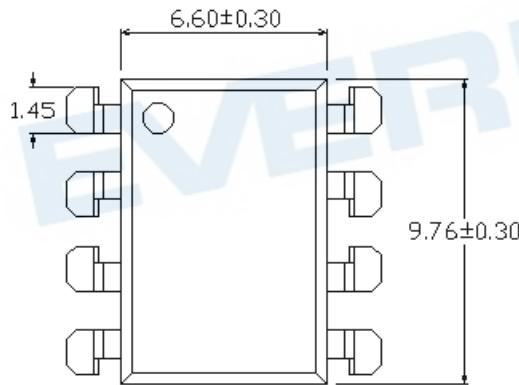
Package Dimension (Dimensions in mm)

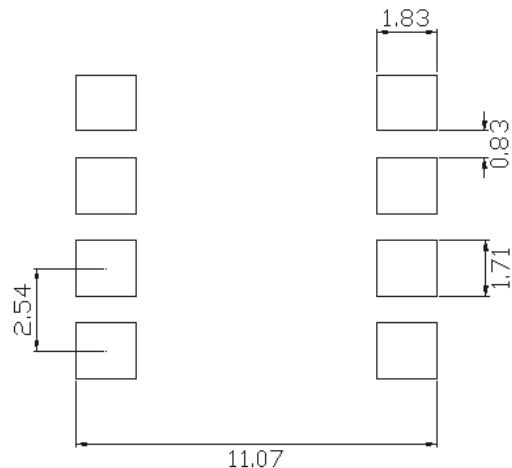
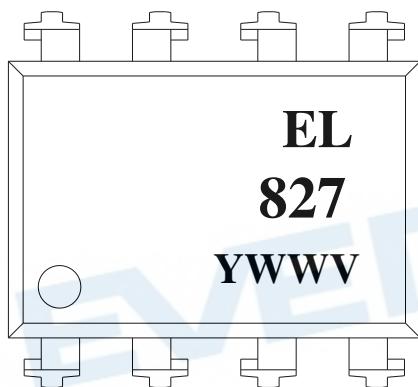
Standard DIP Type



Option M Type



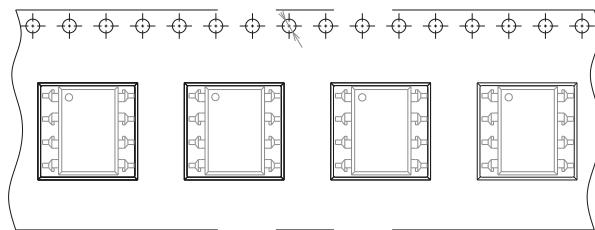
Option S Type**Option S1 Type**

Recommended pad layout for surface mount leadform**Device Marking****Notes**

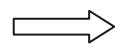
EL827 denotes Device Number
Y denotes 1 digit Year code
WW denotes 2 digit Week code
V denotes VDE (optional)

Tape & Reel Packing Specifications

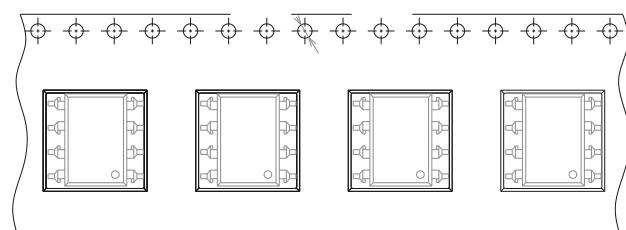
Option TA



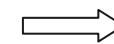
Direction of feed from reel



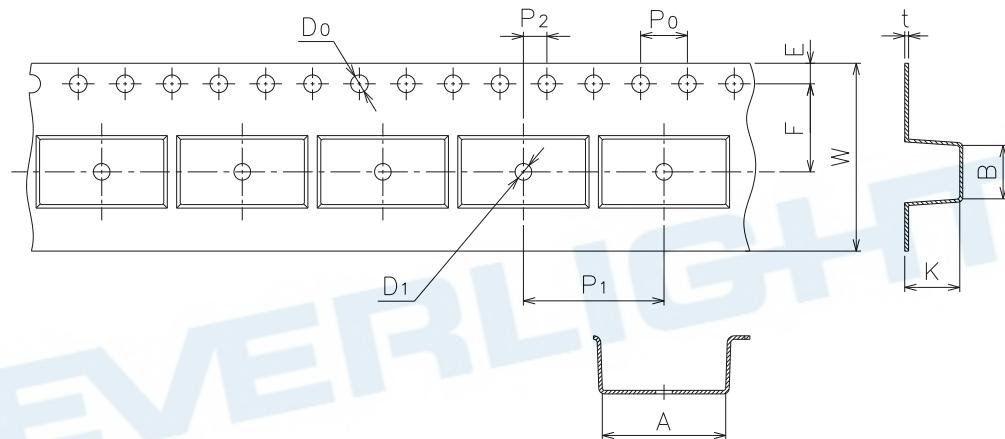
Option TB



Direction of feed from reel



Tape dimensions

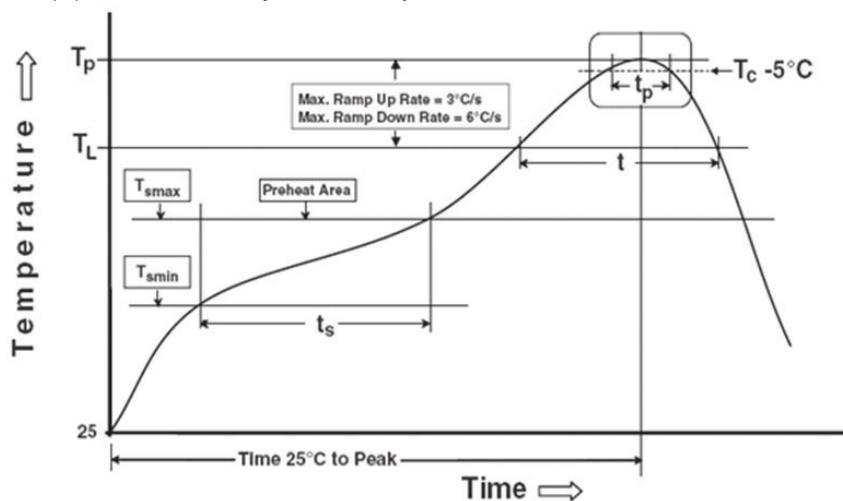


Dimension No.	A	B	D₀	D₁	E	F
Dimension(mm)	10.4 ± 0.1	10.0 ± 0.1	1.5 ± 0.1	$1.5 + 0.25 \\ -0.1$	1.75 ± 0.1	7.5 ± 0.1
Dimension No.	P₀	P₁	P₂	t	W	K
Dimension(mm)	4.0 ± 0.1	12.0 ± 0.1	2.0 ± 0.1	0.4 ± 0.1	16.0 ± 0.3	4.5 ± 0.1

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

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