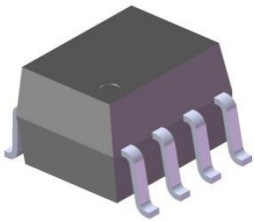


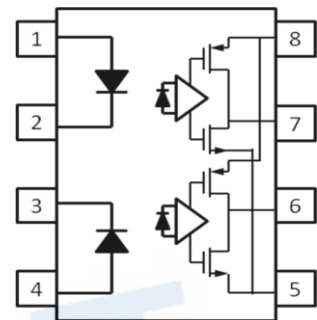
### 8 PIN SOP 3.3V DUAL CHANNEL HIGH SPEED 15MBit/s LOGIC GATE PHOTOCOUPLER EL083L EL086L Series



#### Features

- Compliance Halogen Free  
(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- 3.3 and 5 V CMOS compatibility
- High speed 15Mbit/s
- 10kV/μs min. common mode transient immunity(EL086L)
- Guaranteed performance from -40 to 85°C
- Logic gate output, Fan out 10
- High isolation voltage between input and output (Viso=3750 V rms )
- Compliance with EU REACH
- Pb free and RoHS compliant
- UL and cUL approved
- VDE approved
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved

Schematic



Pin Configuration

- 1, Anode
- 2, Cathode
- 3, Cathode
- 4, Anode
- 5, Gnd
- 6, Vout2
- 7, Vout1
- 8, V<sub>CC</sub>

#### Description

The EL08XL consists of an infrared emitting diode optically coupled to a CMOS detector ICs. It is packaged in a 8-pin SOP package and is suitable for surface mounting technology.

#### Applications

- Line receiver, data transmission
- Data multiplexing
- Switching power supplies
- Pulse transformer replacement
- Computer peripheral interface
- High speed logic ground isolation

Truth Table (Positive Logic)

Input	Output
H	L
L	H

**Absolute Maximum Ratings (T<sub>A</sub>=25°C)**

	Parameter	Symbol	Rating	Unit
Input	Forward current	I <sub>F</sub>	20	mA
	Reverse voltage	V <sub>R</sub>	5	V
	Power dissipation	P <sub>D</sub>	35	mW
Output	Power dissipation	P <sub>C</sub>	85	mW
	Output current	I <sub>O</sub>	20	mA
	Output voltage	V <sub>O</sub>	5.5	V
	Supply voltage	V <sub>CC</sub>	5.5	V
Output Power Dissipation		P <sub>O</sub>	85	mW
Isolation voltage <sup>*2</sup>		V <sub>ISO</sub>	3750	V rms
Operating temperature		T <sub>OPR</sub>	-40 ~ +85	°C
Storage temperature		T <sub>STG</sub>	-55 ~ +125	°C
Soldering temperature <sup>*3</sup>		T <sub>SOL</sub>	260	°C

Notes:

\*1 The V<sub>CC</sub> supply must be bypassed by a 0.1µF capacitor or larger. This can be either a ceramic or solid tantalum capacitor with good high frequency characteristic and should be connected as close as possible to the package V<sub>CC</sub> and GND pins.

\*2 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.

\*3 For 10 seconds

Electrical Characteristics ( $T_A=-40$  to  $85^{\circ}\text{C}$  unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	$V_F$	-	1.4	1.8	V	$I_F = 8\text{mA}$
Reverse voltage	$V_R$	5.0	-	-	V	$I_R = 10\mu\text{A}$
Temperature coefficient of forward voltage	$\Delta V_F/\Delta T_A$	-	-1.8	-	mV/ $^{\circ}\text{C}$	$I_F = 14\text{mA}$
Input capacitance	$C_{IN}$	-	60	-	pF	$V_F=0, f=1\text{MHz}$

Output

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
High level supply current	$I_{CCH}$	-	2.5	8	mA	$I_F=0\text{mA}$
Low level supply current	$I_{CCL}$	-	2.5	8	mA	$I_F=8\text{mA}$
High level output voltage	$V_{OH}$	$V_{CC}-1$	$V_{CC}-0.3$	-	V	$V_{CC}=3.3\text{V}, I_F=0\text{mA}, I_O=-4\text{mA}$
		$V_{CC}-1$	$V_{CC}-0.2$	-	V	$V_{CC}=5\text{V}, I_F=0\text{mA}, I_O=-4\text{mA}$
Low level output voltage	$V_{OL}$	-	0.21	0.6	V	$V_{CC} = 3.3\text{V}, I_F=8\text{mA}, I_O=4\text{mA}$
		-	0.17	0.6	V	$V_{CC} = 5.0\text{V}, I_F=8\text{mA}, I_O=4\text{mA}$
Input threshold current	$I_{FT}$	-	2.5	5	mA	$I_{OL}=20\mu\text{A}$

**Switching Characteristics ( $T_A=-40$  to  $85^\circ\text{C}$ ,  $V_{CC}=3.3\text{V}$ ,  $I_F=8\text{mA}$  unless specified otherwise)**

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition	
Propagation delay time to output high level	$t_{PHL}$	-	38	60	ns	$I_F=8\text{mA}$ , $C_L = 15\text{pF}$ , $V_{CC}=3.3\text{V}$ CMOS Signal Levels	
		-	35	60	ns	$I_F=8\text{mA}$ , $C_L = 15\text{pF}$ , $V_{CC}=5\text{V}$ CMOS Signal Levels	
Propagation delay time to output low level	$t_{PLH}$	-	41	60	ns	$I_F=8\text{mA}$ , $C_L = 15\text{pF}$ , $V_{CC}=3.3\text{V}$ CMOS Signal Levels	
		-	46	60	ns	$I_F=8\text{mA}$ , $C_L = 15\text{pF}$ , $V_{CC}=5\text{V}$ CMOS Signal Levels	
Pulse width distortion	$ t_{PHL} - t_{PLH} $	0	6	30	ns	$I_F=8\text{mA}$ , $C_L = 15\text{pF}$ , $V_{CC}=3.3\text{V}$ CMOS Signal Levels	
		0	8	30	ns	$I_F=8\text{mA}$ , $C_L = 15\text{pF}$ , $V_{CC}=5\text{V}$ CMOS Signal Levels	
Output rise time	$t_r$	-	5.5	-	ns	$I_F=8\text{mA}$ , $C_L = 15\text{pF}$ , $V_{CC}=3.3\text{V}$ CMOS Signal Levels	
Output fall time	$t_f$	-	6	-	ns	$I_F=8\text{mA}$ , $C_L = 15\text{pF}$ , $V_{CC}=3.3\text{V}$ CMOS Signal Levels	
Common mode transient Immunity at logic high*4	$ CM_H $	083L	5,000	-	-	$V/\mu\text{S}$	$I_F = 0\text{mA}$ , $T_A=25^\circ\text{C}$ $V_{CM}=1000\text{Vp-p}$
		086L	10,000	-	-	$V/\mu\text{S}$	$I_F = 0\text{mA}$ , $T_A=25^\circ\text{C}$ $V_{CM}=1000\text{Vp-p}$
Common mode transient immunity at logic low*5	$ CM_L $	083L	5,000	-	-	$V/\mu\text{S}$	$I_F = 8\text{mA}$ , $T_A=25^\circ\text{C}$ $V_{CM}=1000\text{Vp-p}$
		086L	10,000	-	-	$V/\mu\text{S}$	$I_F = 8\text{mA}$ , $T_A=25^\circ\text{C}$ $V_{CM}=1000\text{Vp-p}$

Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs. Forward Voltage

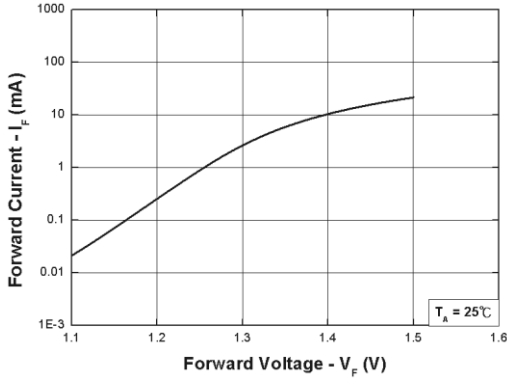


Figure 2. Input Threshold Current vs. Ambient Temperature

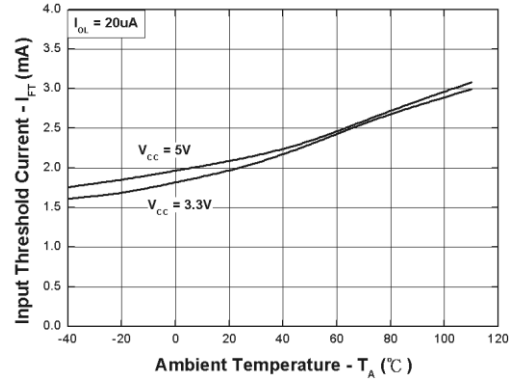


Figure 3. High Level Supply Current vs. Ambient Temperature

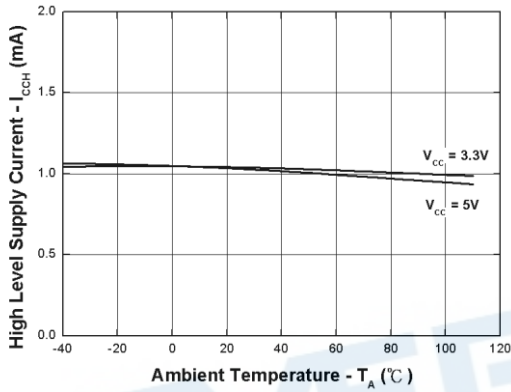


Figure 4. Low Level Supply Current vs. Ambient Temperature

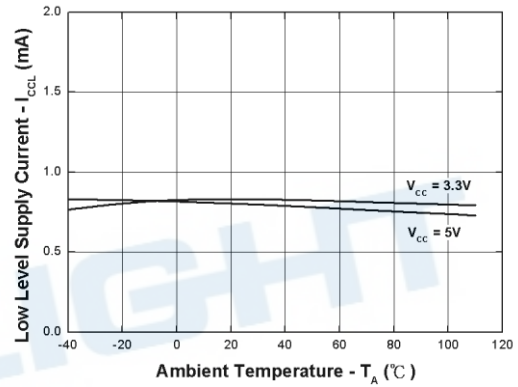


Figure 5. Switching Time vs. Forward Current

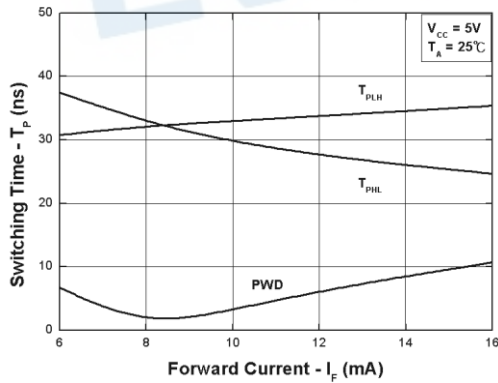


Figure 6. Switching Time vs. Forward Current

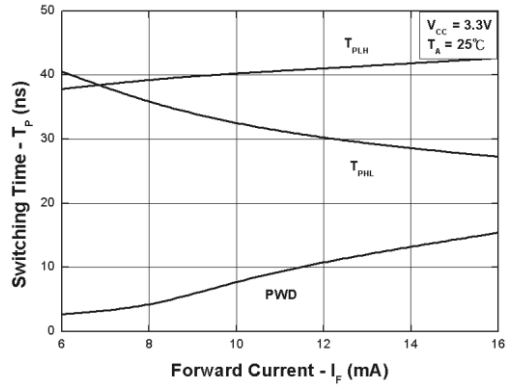


Figure 7. Forward voltage vs. Ambient Temperature

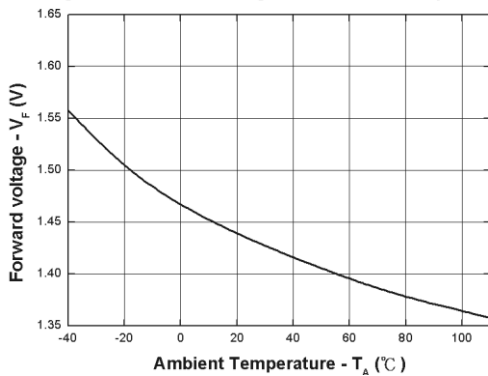


Fig. 8 Test circuit and waveforms for  $t_{PHL}$ ,  $t_{PLH}$ ,  $t_r$ , and  $t_f$

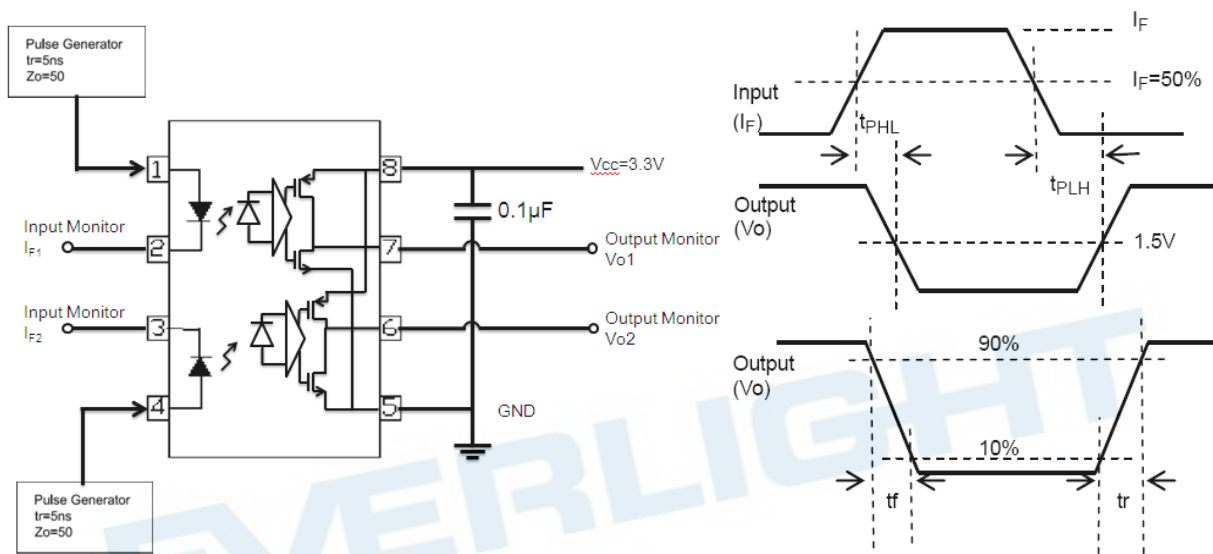
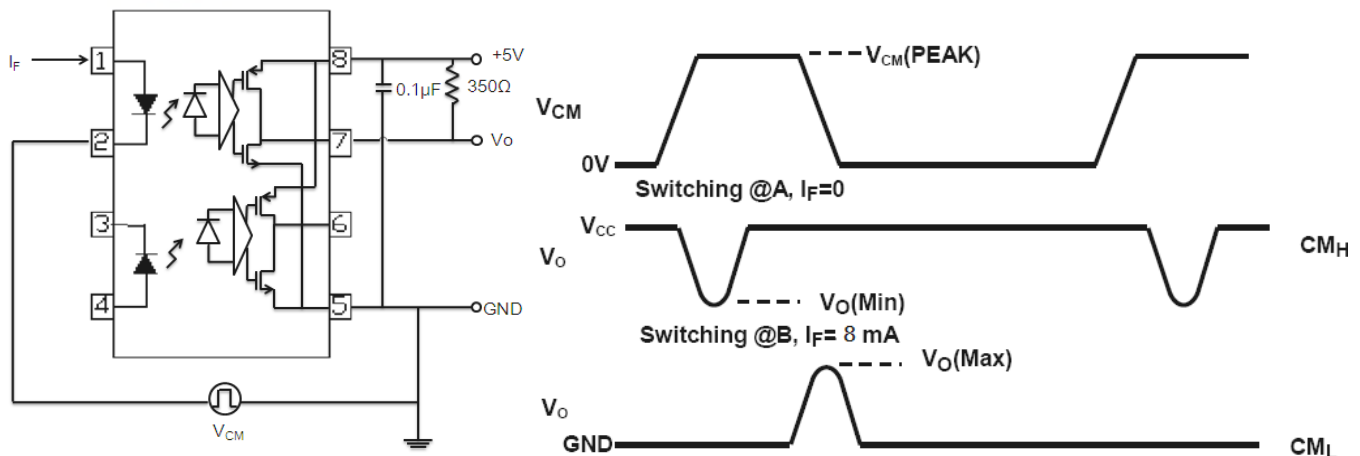


Fig. 9 Test circuit Common mode Transient Immunity



Note

- \*4.  $CM_H$ – The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the HIGH state (i.e.,  $V_{OUT} > 2.0V$ ).
- \*5.  $CM_L$ – The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the LOW output state (i.e.,  $V_{OUT} < 0.8V$ ).

## Order Information

### Part Number

**EL08XL(Z)-V**

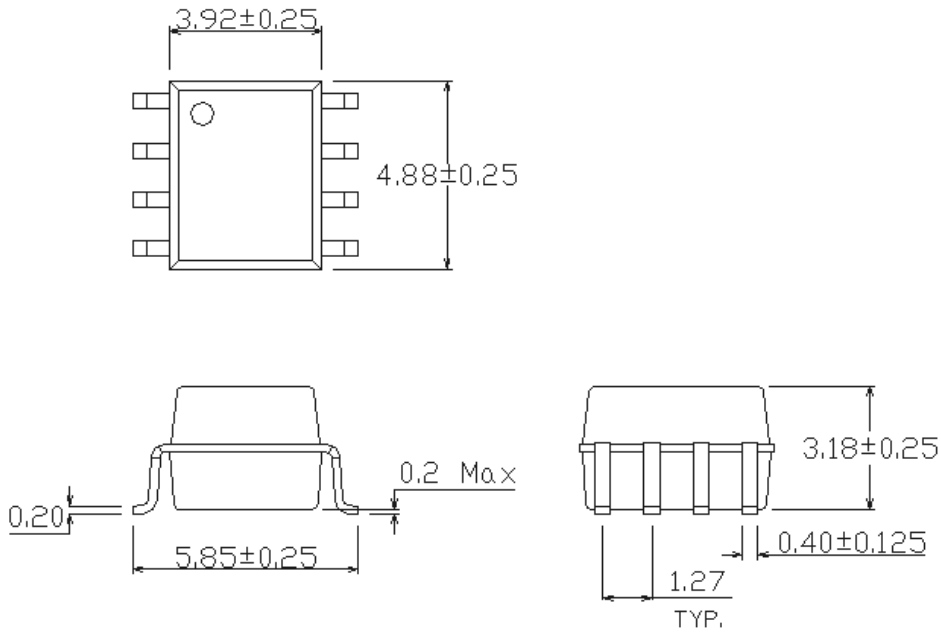
### Note

08XL = Part No  
Z = Tape and reel option (TA, TB).  
V = VDE (optional)

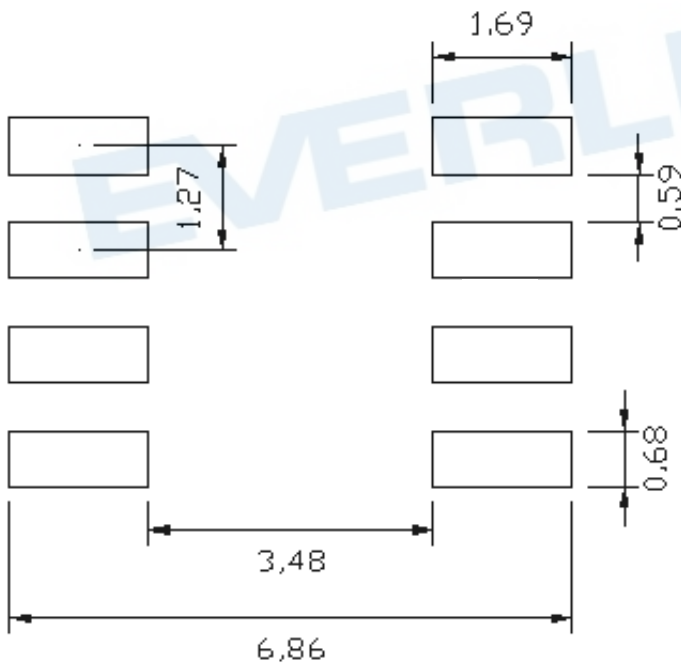
Option	Description	Packing quantity
(TA)	TA tape & reel option	2000 units per reel
(TB)	TB tape & reel option	2000 units per reel
(TA)-V	TA tape & reel option + VDE	2000 units per reel
(TB)-V	TB tape & reel option + VDE	2000 units per reel

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**Package Dimension**  
 (Dimensions in mm)



**Recommended pad layout for surface mount leadform**



**Notes**

Suggested pad dimension is just for reference only.  
 Please modify the pad dimension based on individual need.



## Device Marking



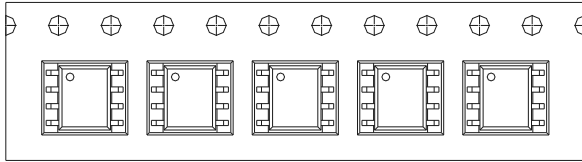
## Notes

EL	denotes EVERLIGHT
083L	denotes Device Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

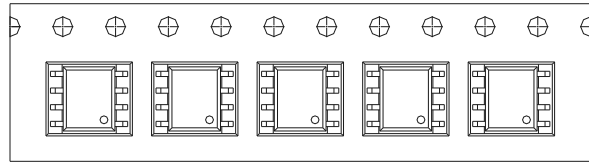
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**Tape & Reel Packing Specifications**

**Option TA**



**Option TB**

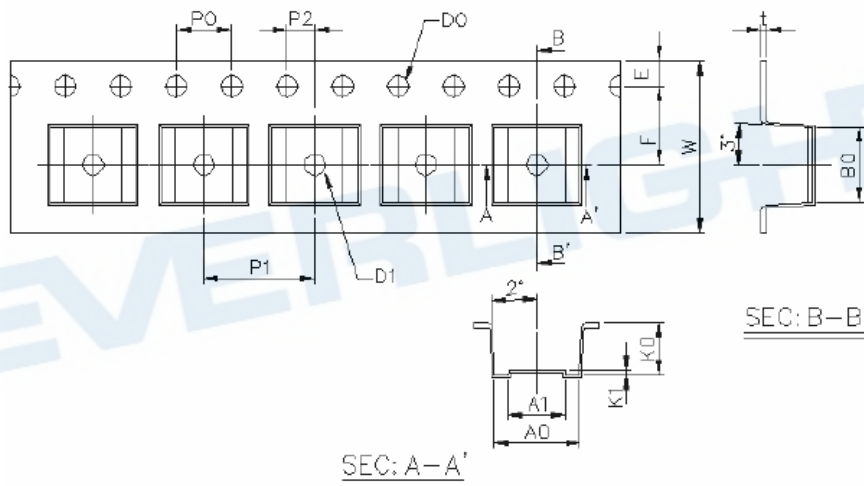


Direction of feed from reel



Direction of feed from reel

**Tape dimension**

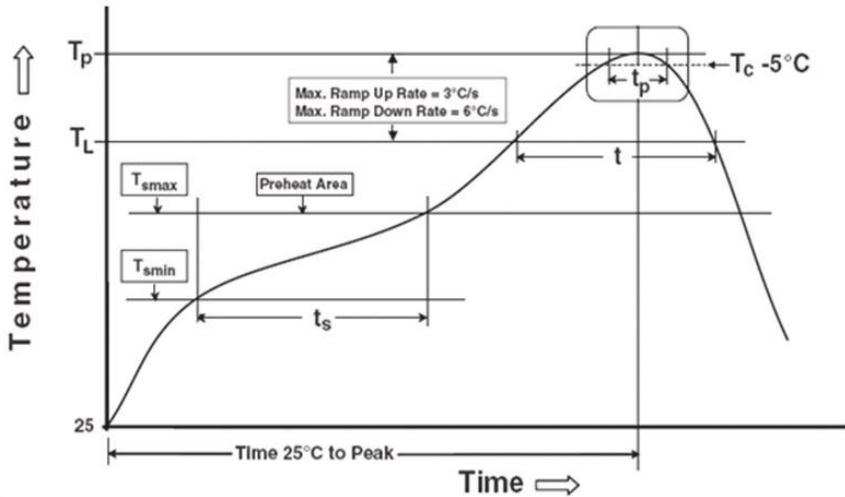


Dimension No.	<b>A0</b>	<b>A1</b>	<b>B0</b>	<b>D0</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension(mm)	6.2±0.1	4.1±0.1	5.28±0.1	1.5±0.1	1.5±0.3	1.75±0.1	5.5±0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K0</b>	<b>K1</b>
Dimension(mm)	4.0±0.1	8.0±0.1	2.0±0.1	0.4±0.1	12.0+0.3/ -0.1	3.7±0.1	0.3±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

## Disclaimer

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