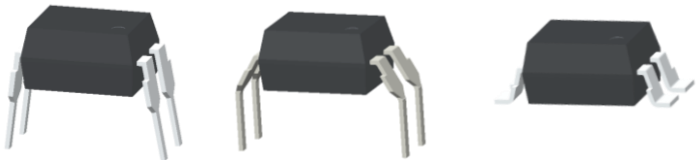
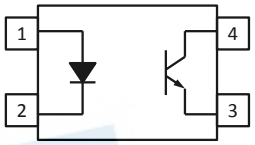
DATASHEET

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER
EL817H-G Series



Schematic



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

Features:

- Halogens free.
  (Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)
- Current transfer ratio
  (CTR: 50~400% at I_F = 5mA, V_{CE} = 5V)
- Operating temperature -55°C~125°C
- High isolation voltage between input and output (Viso = 5000Vrms)
- Creepage distance > 7.62mm
- Compact small outline package
- Compliance with EU REACH.
- The product itself will remain within RoHS compliant version
- UL and cUL approved(No.E214129)
- VDE approved (No.132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved

Description

The EL817H-G series of devices each consist of an infrared emitting diodes,
optically coupled to a phototransistor detector.
They are packaged in a 4-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)*1

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	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*2		V_{ISO}	5000	V rms
Operating Temperature		T_{OPR}	-55 to 125	°C
Storage Temperature		T_{STG}	-55 to 150	°C
Soldering Temperature*3		T_{SOL}	260	°C

Notes:
*1 Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.
*2 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.
*3 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 = 10mA
Reverse Current	I_R	-	-	10	μA	V_R = 5V
Input capacitance	C_{in}	-	30	250	pF	V = 0, f = 1kHz

Output

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Collector-Emitter dark current	I_{CEO}	-	-	200	nA	V_{CE} = 48V, 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 = 0.1mA

Transfer Characteristics

Parameter		Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer ratio	EL817H	CTR	50	-	400	%	I_F = 5mA ,V_{CE} = 5V
	EL817HA		80	-	160		
	EL817HB		130	-	260		
	EL817HC		200	-	400		
Collector-Emitter saturation voltage		$V_{CE(sat)}$	-	-	0.35	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
Cut-off frequency		fc	-	80	-	kHz	V_{CE} = 5V, I_C = 2mA R_L = 100Ω, -3dB
Rise time		t_r	-	6	18	μs	V_{CE} = 2V, I_C = 2mA, R_L = 100Ω
Fall time		t_f	-	8	18	μs	

* Typical values at T_a = 25°C

Typical Electro-Optical Characteristics Curves*

Figure 1. Forward Current vs Forward Voltage

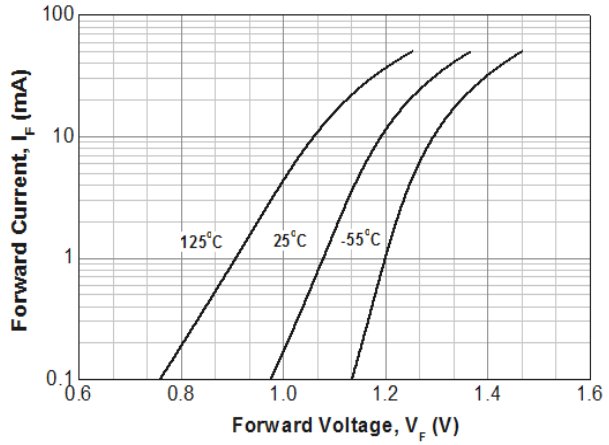


Figure 2. Normalized Current Transfer Ratio vs Forward Current

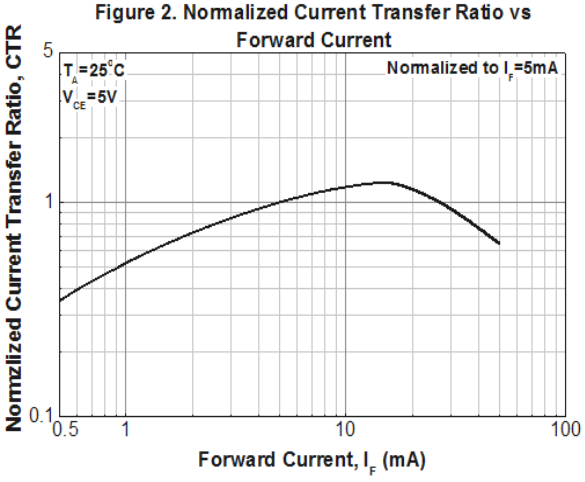


Figure 3. Current Transfer Ratio vs Ambient Temperature

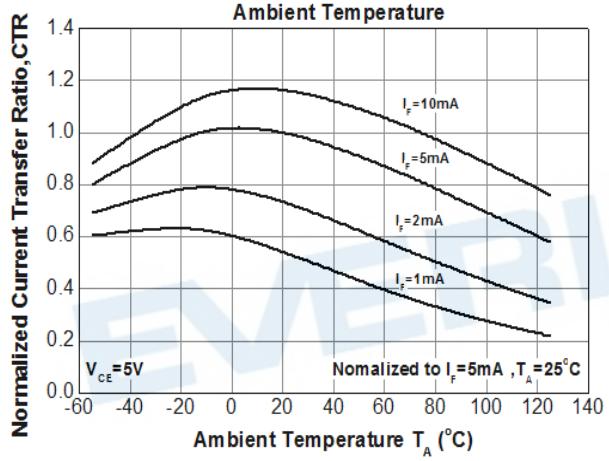


Figure 4. Dark Current vs Ambient Temperature

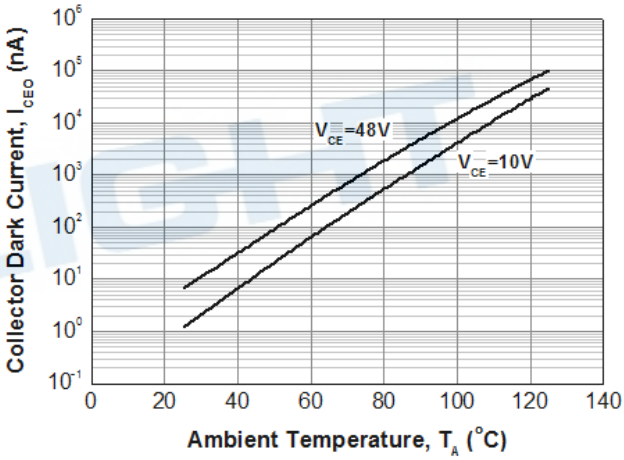


Figure 5. Collector-Emitter Saturation Voltage vs Collector Current

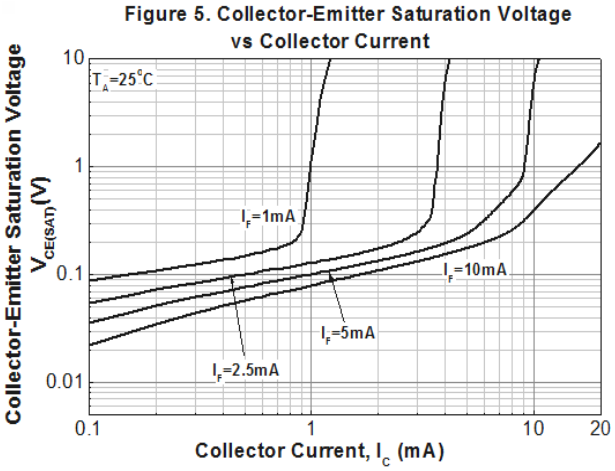
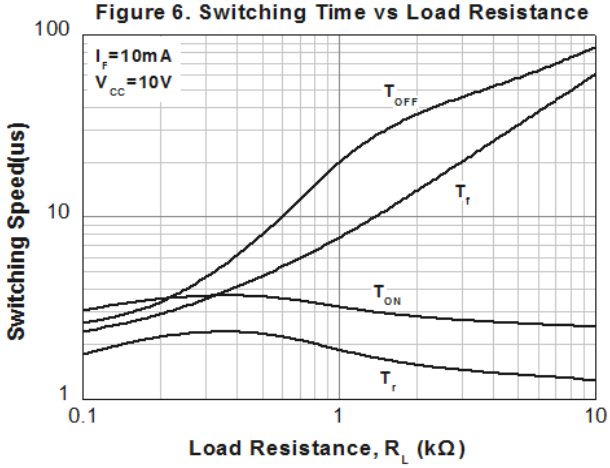


Figure 6. Switching Time vs Load Resistance



*Please be aware that all data in the graph are just for reference and not for guarantee.

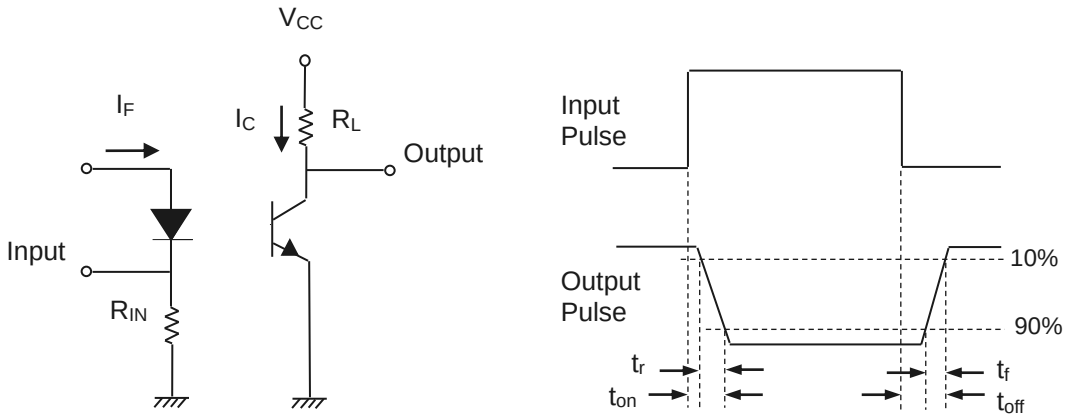


Figure 7. Switching Time Test Circuit & Waveforms

Order Information

Part Number

EL817HX(Y)(Z)-VG

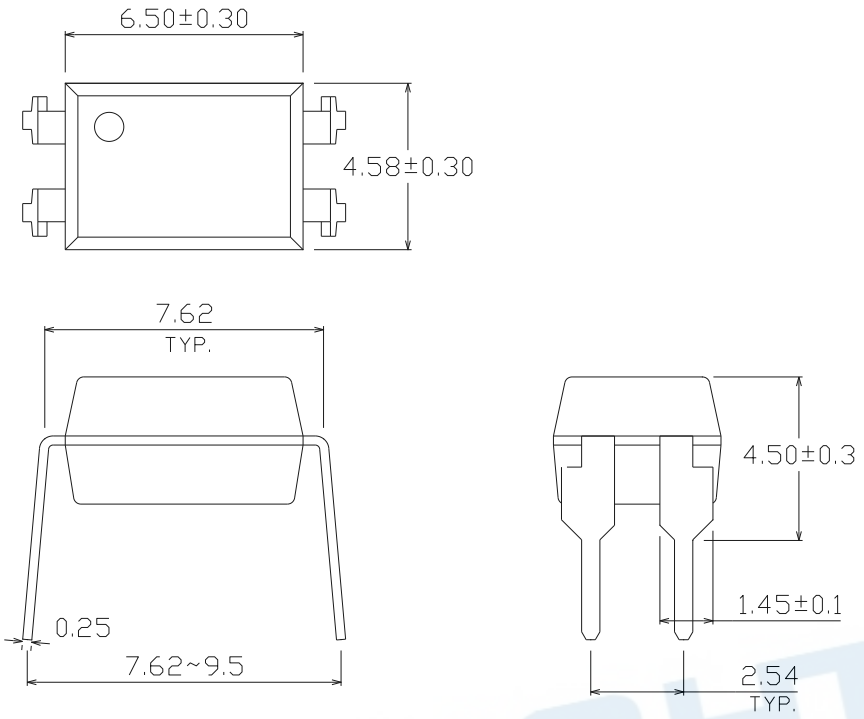
Note

H = Operating high temperature
X = Lead form option (S1, S2, M or none)
Y = CTR Rank (A, B, C or none)
Z = Tape and reel option (TU, TD or none)
V = VDE safety (optional)
G = Halogens free

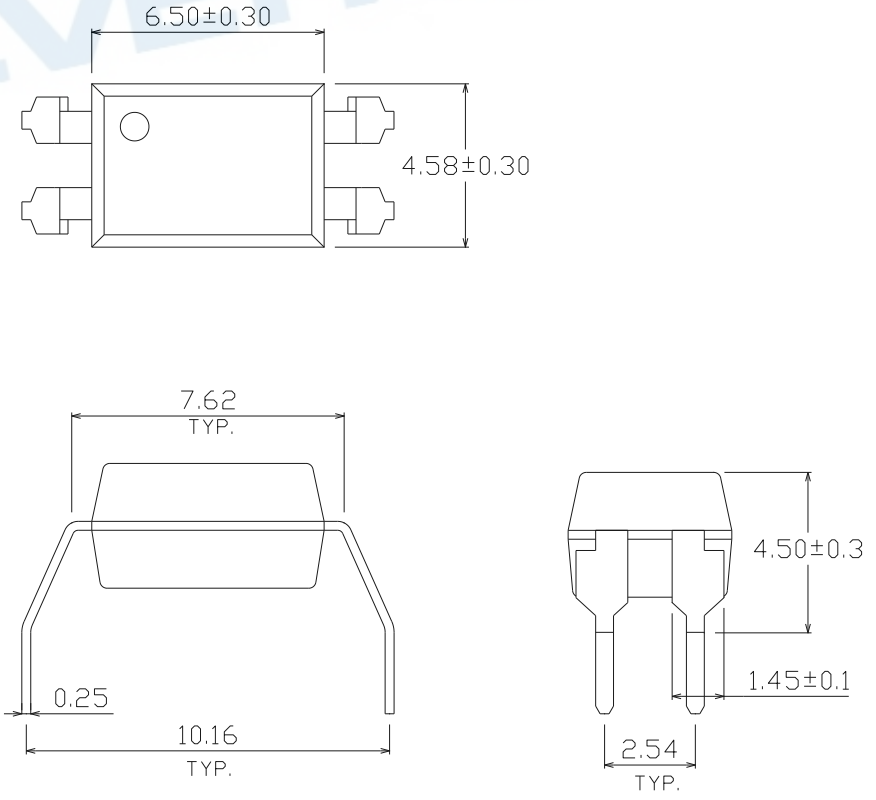
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S1 (TU)	Surface mount lead form (low profile) + TU tape & reel option	1500 units per reel
S1 (TD)	Surface mount lead form (low profile) + TD tape & reel option	1500 units per reel
S2 (TU)	Surface mount lead form (low profile) + TU tape & reel option	2000 units per reel
S2 (TD)	Surface mount lead form (low profile) + TD tape & reel option	2000 units per reel

Package Dimension (Dimensions in mm)

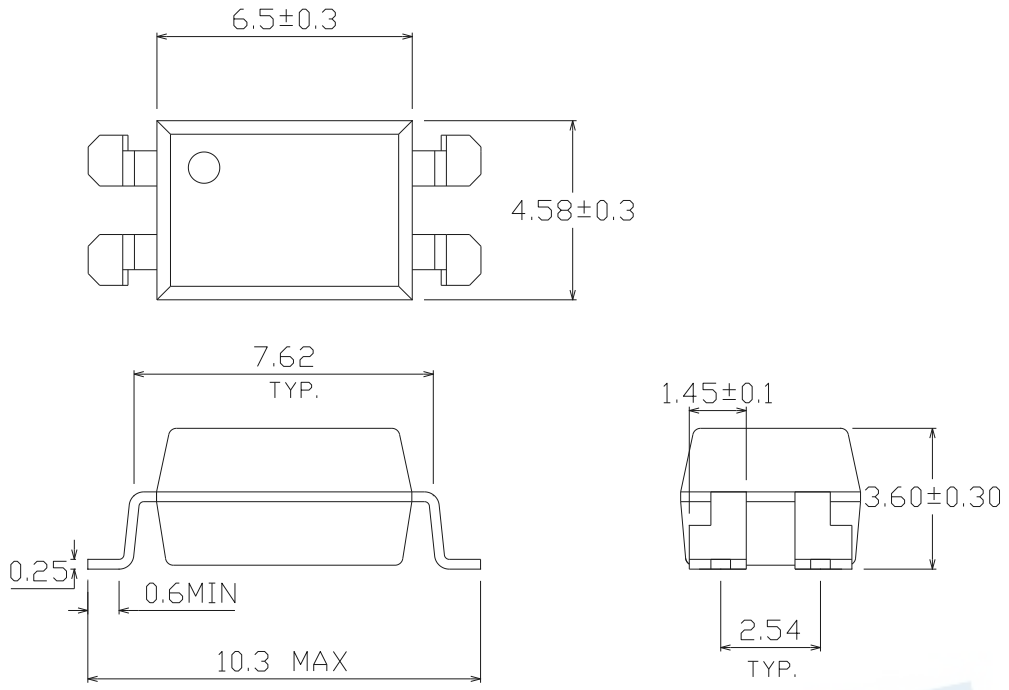
Standard DIP Type



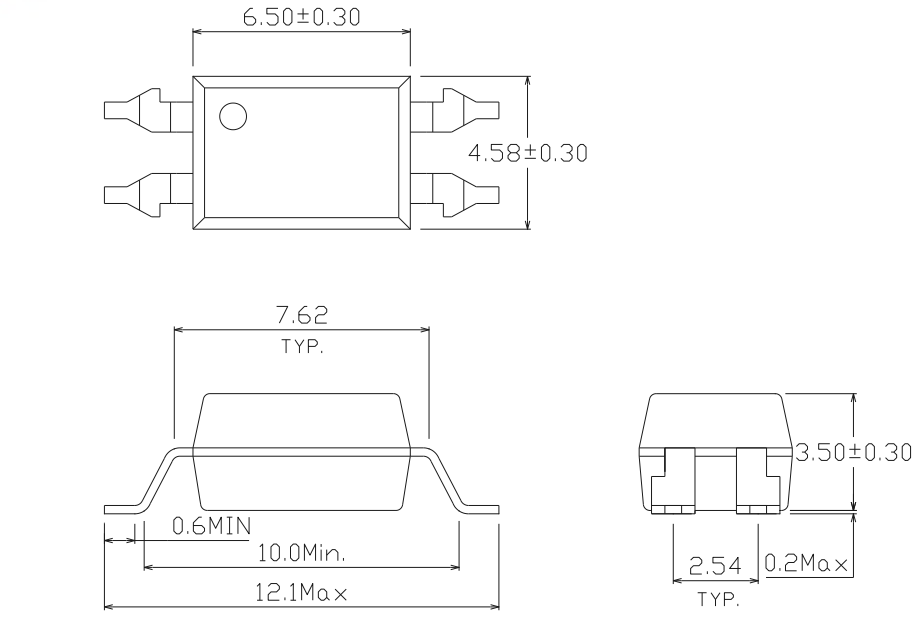
Option M Type



Option S1 Type

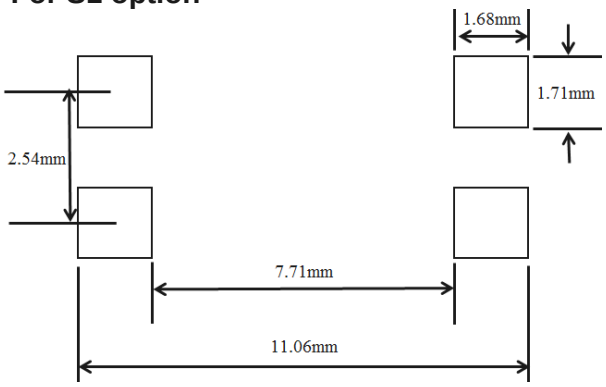


Option S2 Type

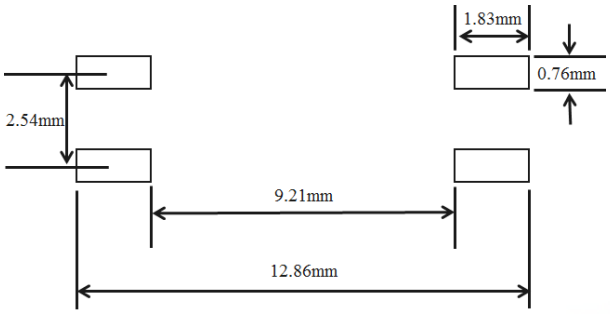


Recommended pad layout for surface mount leadform

For S1 option



For S2 option



Notes

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

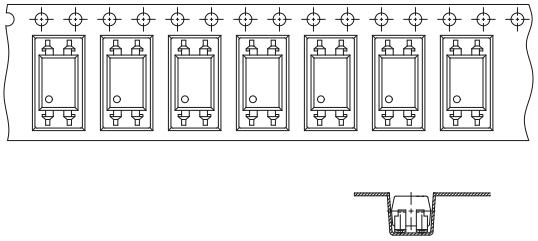
Device Marking

Notes

EL	denotes EVERLIGHT
817	denotes Device Number
H	denotes Operating High Temperature
F	denotes Factory Code (G: China and Green part)
R	denotes CTR Rank (A, B, C or none)
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

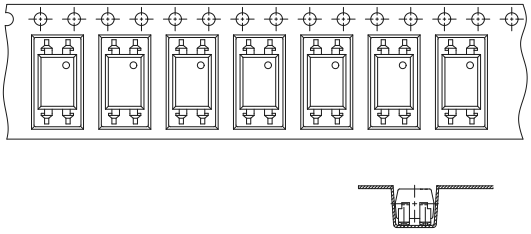
Tape & Reel Packing Specifications

Option TD



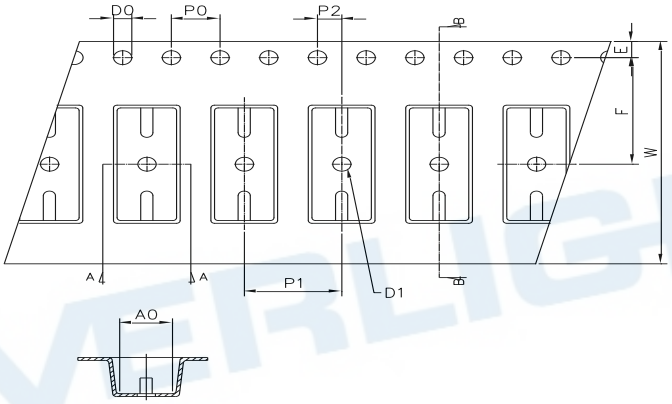
Direction of feed from reel

Option TU



Direction of feed from reel

Tape dimensions

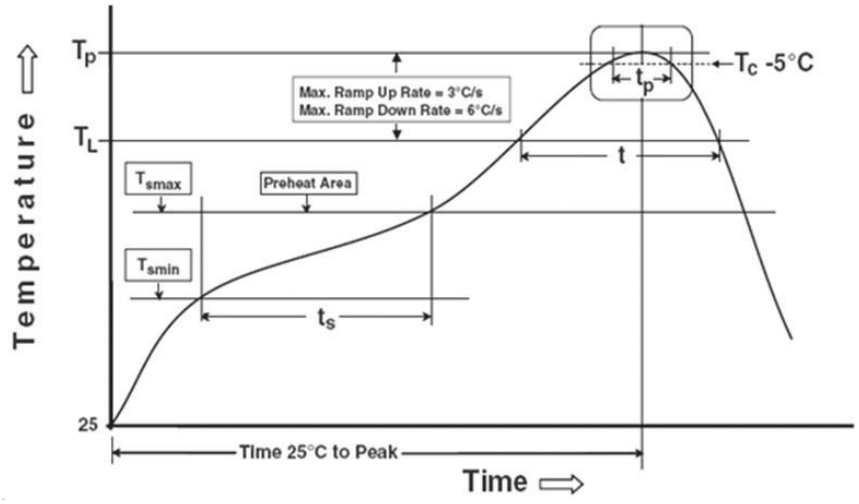


Dimension No.	Ao	Bo	Do	D1	E	F
Dimension (mm) S1	4.90±0.1	10.40±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.50±0.1
Dimension (mm) S2	4.88±0.1	12.55±0.1	1.5±0.1	1.50±0.1	1.75±0.1	11.5±0.1
Dimension No.	**Po**	**P1**	**P2**	**t**	**W**	**Ko**
Dimension (mm) S1	4.00±0.1	8.00±0.1	2.00±0.1	0.40±0.1	16.00±0.3	4.60±0.1
Dimension (mm) S2	4.00±0.1	8.00±0.1	2.00±0.1	0.40±0.1	24.00±0.3	4.00±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°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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DISCLAIMER

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
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