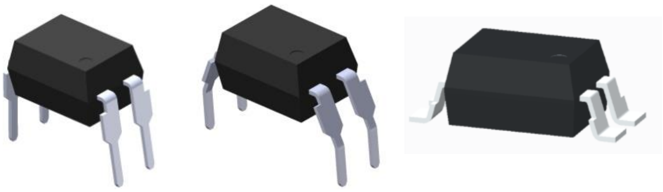
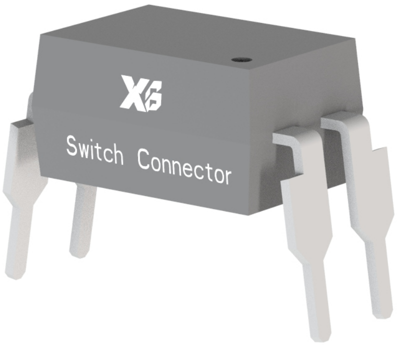
标准&定制开关连接器产品制造商
DONG GUAN XI BANG ELECTRONICS CO. , LTD.

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER
AC INPUT PHOTOCOUPLER
EL814 Series

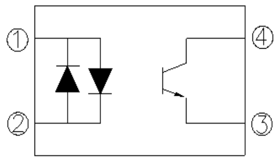




Features

- Compliance Halogens Free
  (Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm)
- AC input response
- Current transfer ratio (CTR: Min. 20% at I_F = ±1mA,V_{CE} = 5V)
- High isolation voltage between input and output (Viso = 5000 V rms)
- Wide Operating temperature range -55~110ºC
- High collector-emitter voltage V_{CEO} = 80V
- Compact dual-in-line 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

Schematic



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

Description

The EL814 series of devices each consist of two infrared emitting diodes, connected in inverse parallel, optically coupled to a phototransistor detector.
They are packaged in a 4-pin DIP package and available in side-lead spacing and SMD option.

Applications

- AC line monitor
- Programmable controllers
- Telephone line interface
- Unknown polarity DC sensor

Absolute Maximum Ratings (Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	±60	mA
	Peak forward current (t = 10μs)	I_{FM}	1	A
	Power dissipation	P_D	100	mW
	Derating factor (above 100 ºC)		2.9	mW/ºC
Output	Power dissipation	P_C	150	mW
	Derating factor (above 100 ºC)		5.8	mW/ºC
	Collector-Emitter voltage	V_{CEO}	80	V
	Emitter-Collector voltage	V_{ECO}	6	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 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 (Ta=25℃ unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	V_F	-	1.2	1.4	V	$I_F = \pm 20mA$
Input capacitance	C_{in}	-	50	250	pF	V = 0, f = 1KHz

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}	6	-	-	V	$I_E = 0.1mA$

Transfer Characteristics

Parameter		Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer ratio	EL814	CTR	20	-	300	%	$I_F = \pm 1mA$,$V_{CE} = 5V$
	EL814A		50	-	150		
CTR Symmetry			0.7		1.3		$I_F = \pm 1mA$,$V_{CE} = 5V$
Collector-emitter saturation voltage		$V_{CE(sat)}$	-	0.05	0.2	V	$I_F = \pm 20mA$,$I_c = 1mA$
Isolation resistance		R_{IO}	5×10^{10}	10^{11}	-	Ω	V_{IO} = 500Vdc, 40~60%R.H
Cut-off frequency		f_c	-	80	-	kHz	V_{CE}=5V, I_C=2 mA, R_L=100Ω, -3dB
Floating capacitance		C_{IO}	-	0.6	1.0	pF	V_{IO} = 0, f = 1MHz
Rise time		T_r	-	-	18	μs	V_{CE}=2V, I_C=2mA, R_L=100Ω
Fall time		T_f	-	-	18	μs	

* Typical values at T_a = 25°C

Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs Forward Voltage

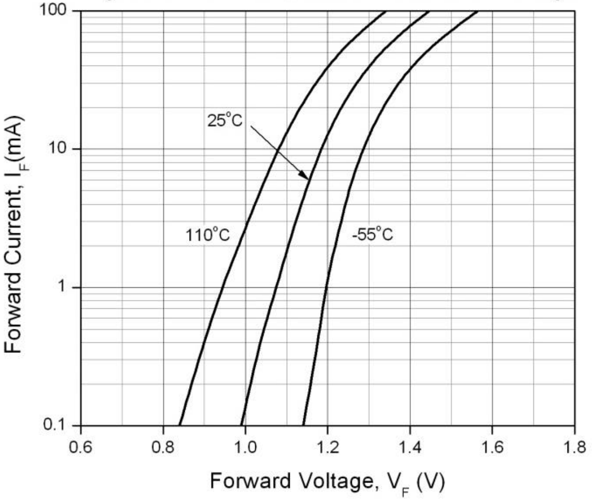


Figure 2. Normalized Current Transfer Ratio vs Forward Current

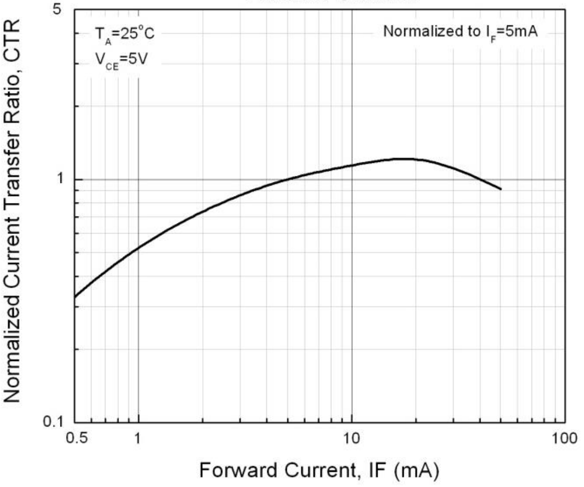


Figure 3. Current Transfer Ratio vs Ambient Temperature

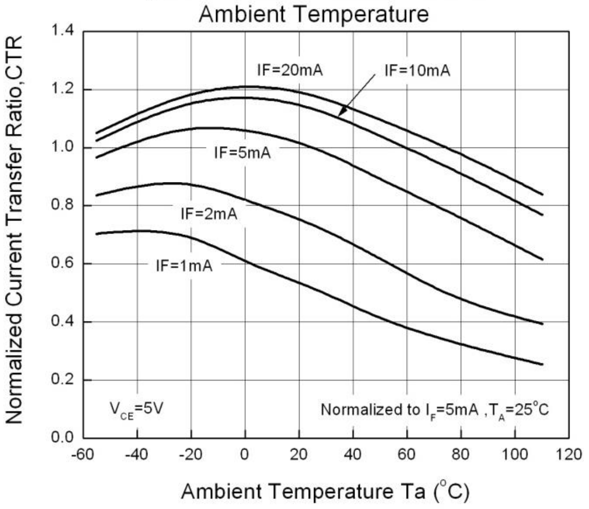


Figure 4. Dark Current vs Ambient Temperature

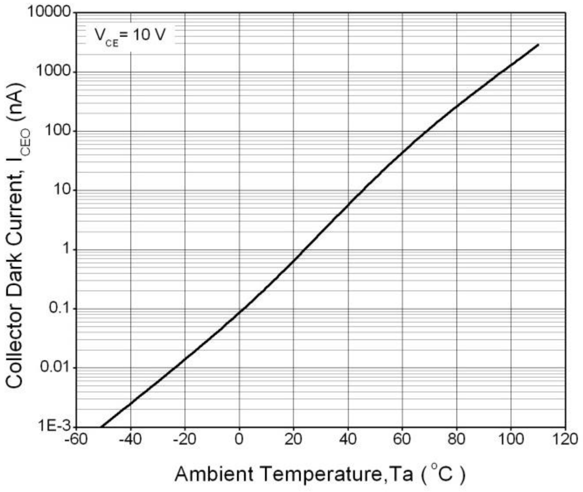


Figure 5. Collector Current vs Collector Voltage

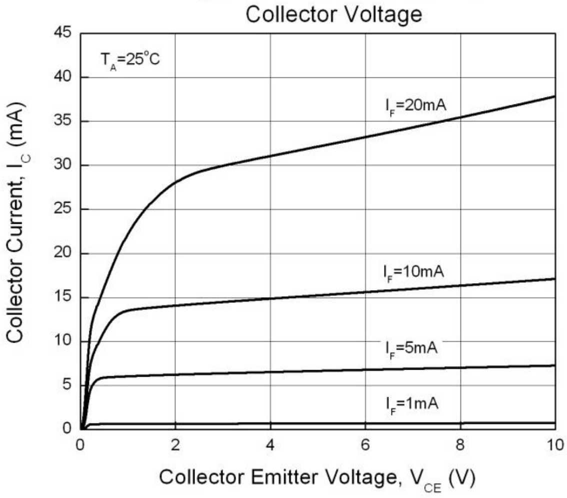


Figure 6. Collector Current vs Collector Voltage

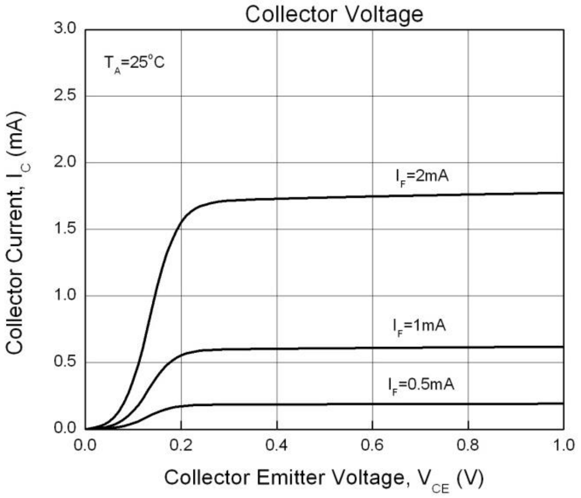


Figure 7. Collector-Emitter Saturation Voltage vs Collector Current

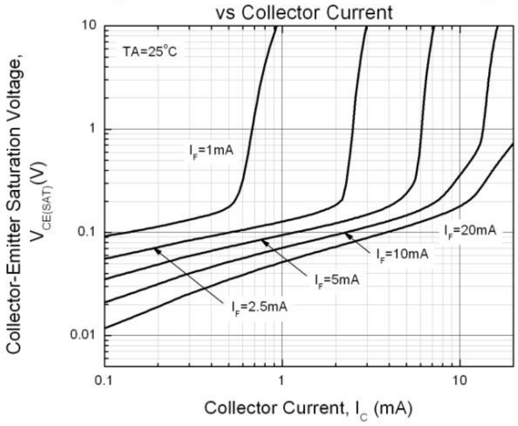
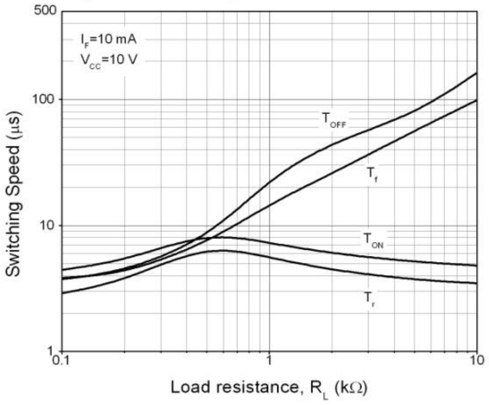


Figure 8. Switching Time vs Load Resistance



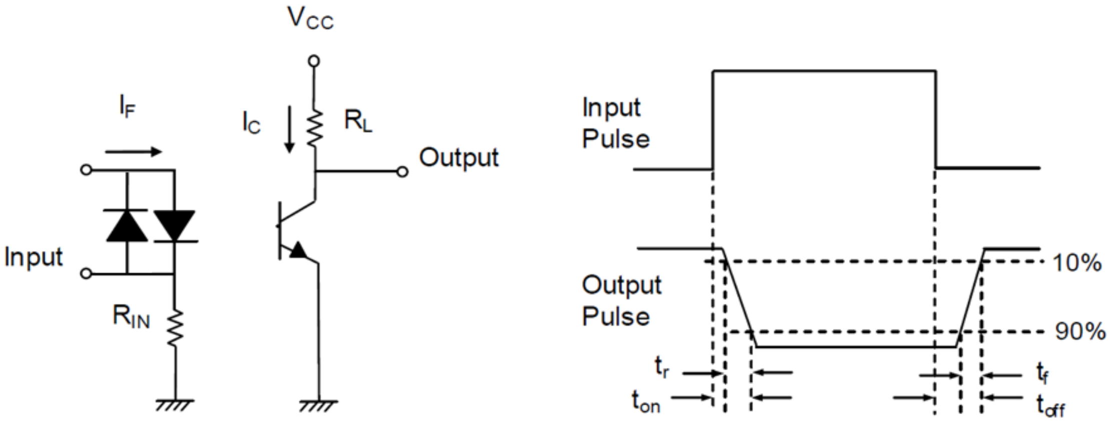


Figure 9. Switching Time Test Circuit & Waveforms

Order Information

Part Number

EL814X(Y)(Z)-V

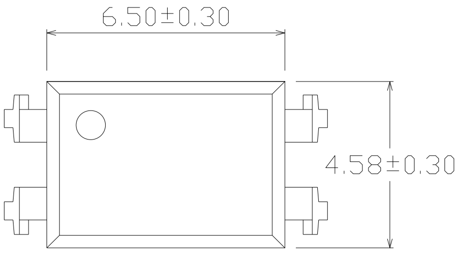
Notes

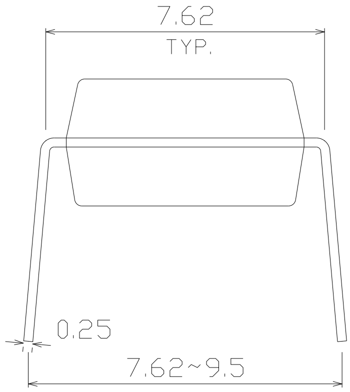
X = Lead form option (S, S1, M or none)
Y = CTR Rank (A or none)
Z = Tape and reel option (TA, TB, TU, TD or none)
V = VDE safety (optional)

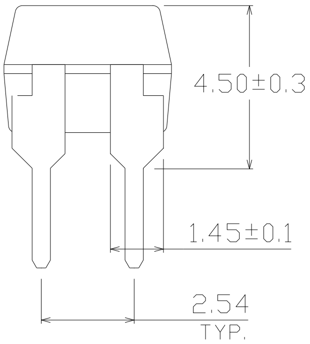
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S (TA)	Surface mount lead form + TA tape & reel option	1000 units per reel
S (TB)	Surface mount lead form + TB tape & reel option	1000 units per reel
S1 (TA)	Surface mount 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
S (TU)	Surface mount lead form + TU tape & reel option	1500 units per reel
S (TD)	Surface mount lead form + TD tape & reel option	1500 units per reel
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

Package Dimension (Dimensions in mm)

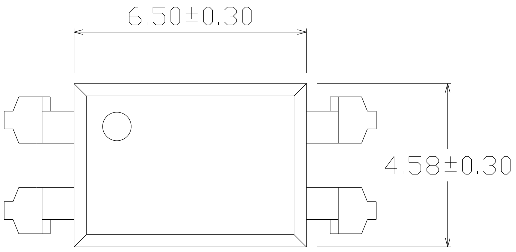
Standard DIP Type

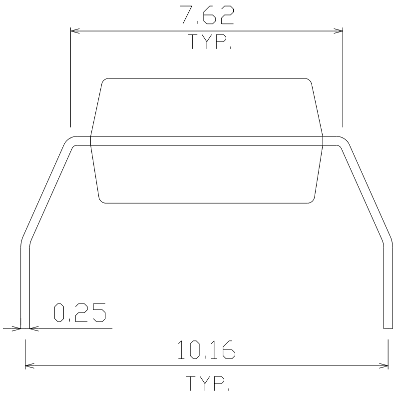


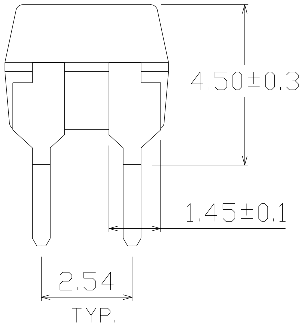




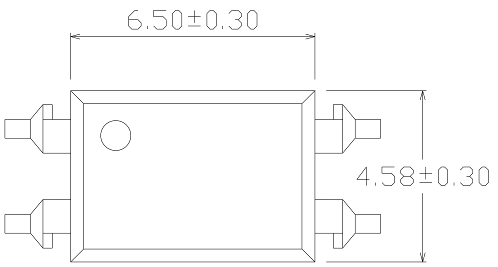
Option M Type

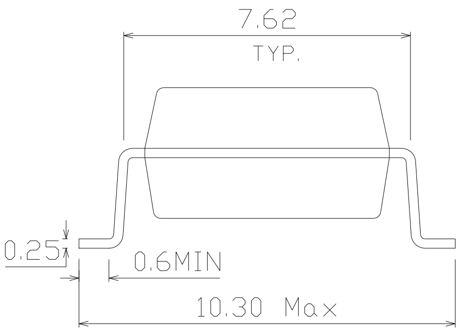


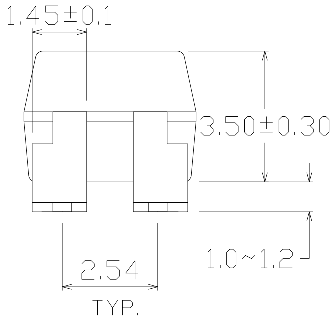




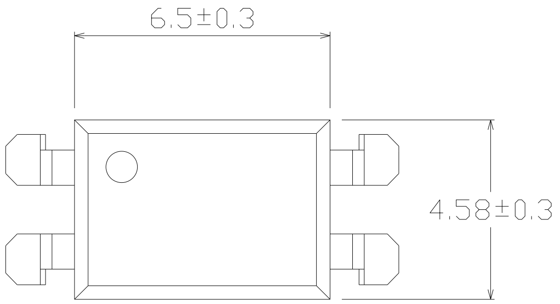
Option S Type

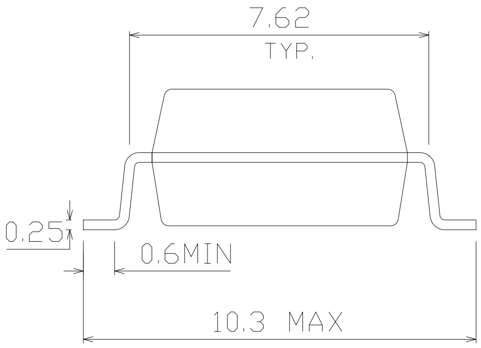


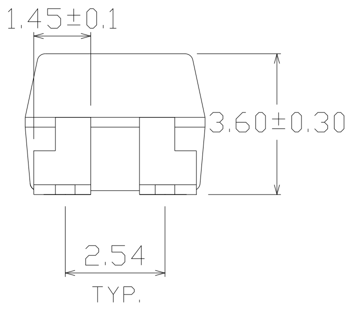




Option S1 Type

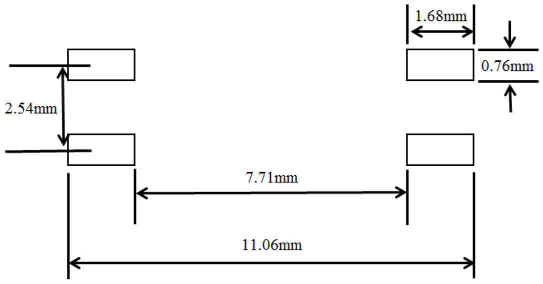




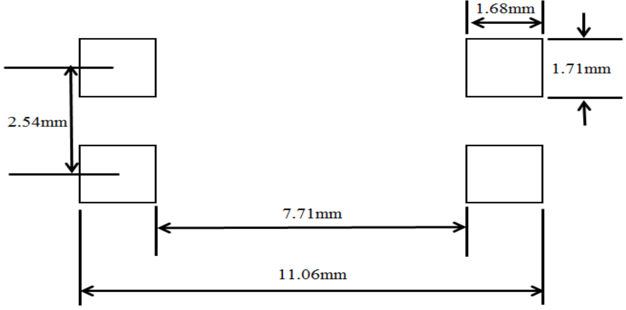


Recommended pad layout for surface mount leadform

For S option



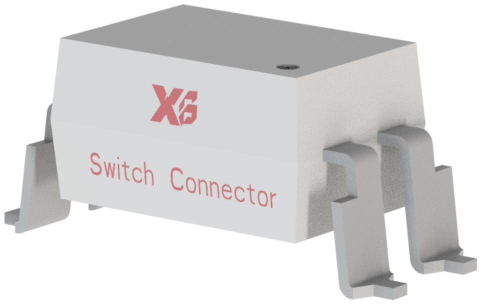
For S1 option



Notes

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

Device Marking

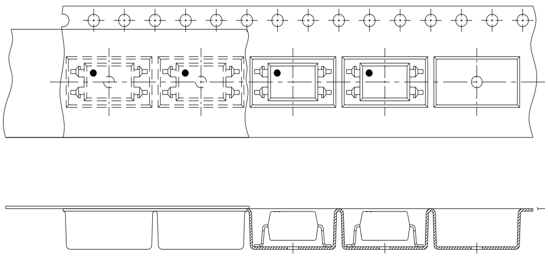


Notes

EL denotes XI BNANG 814
denotes Device Number
F denotes Factory Code (G: China and Green part
) R denotes CTR Rank (A or none)
Y denotes 1 digit Year code WW
denotes 2 digit Week code V
denotes VDE (optional)

Tape & Reel Packing Specifications

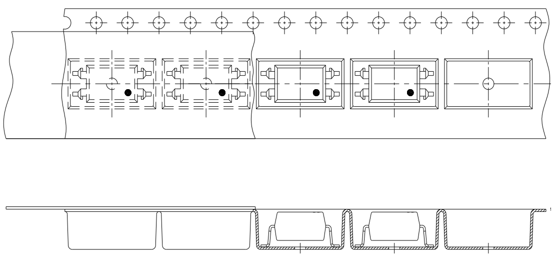
Option TA



Direction of feed from reel

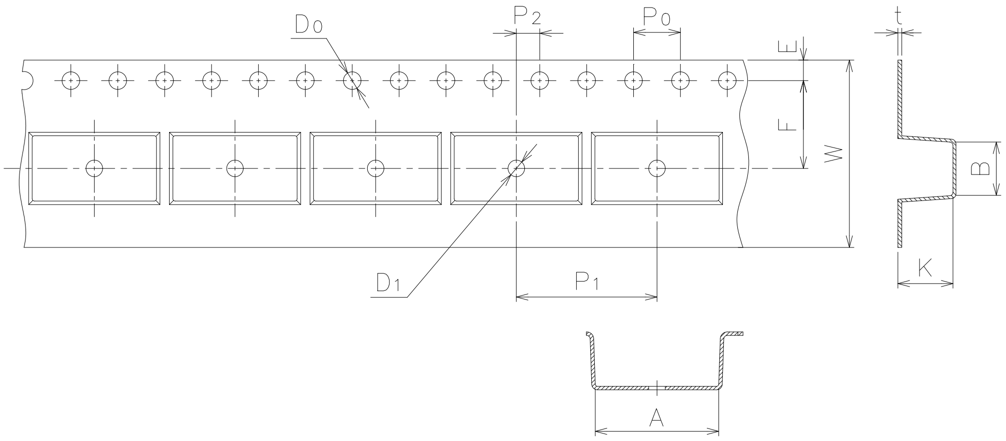
⇨

Option TB



Direction of feed from reel

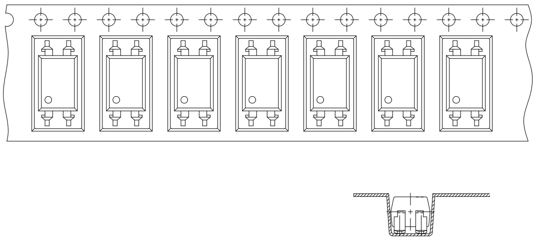
⇨



Dimension No.	**A**	**B**	**Do**	**D1**	**E**	**F**
Dimension (mm) S	10.7±0.1	4.65±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.5±0.1
Dimension (mm) S1	10.7±0.1	4.65±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.5±0.1

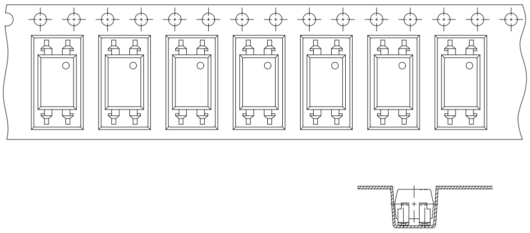
Dimension No.	**Po**	**P1**	**P2**	**t**	**W**	**K**
Dimension (mm) S	4.0±0.1	12.0±0.1	2.0±0.1	0.4±0.1	16.0±0.3	4.75±0.1
Dimension (mm) S1	4.0±0.1	12.0±0.1	2.0±0.1	0.4±0.1	16.0±0.3	3.90±0.1

Option TD



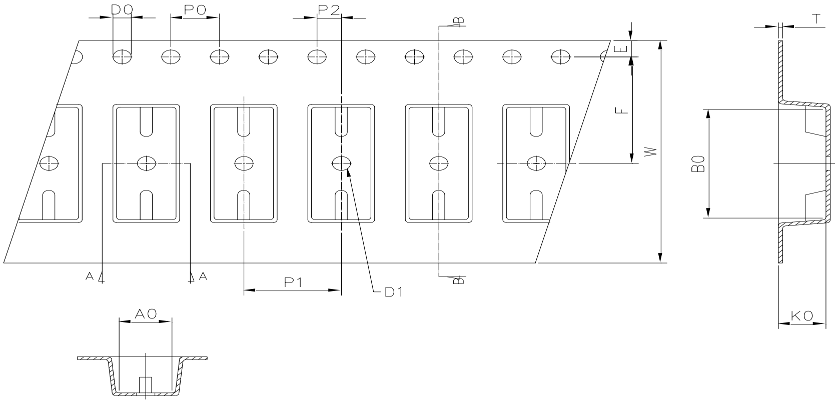
Direction of feed from reel

Option TU



Direction of feed from reel

Tape dimensions

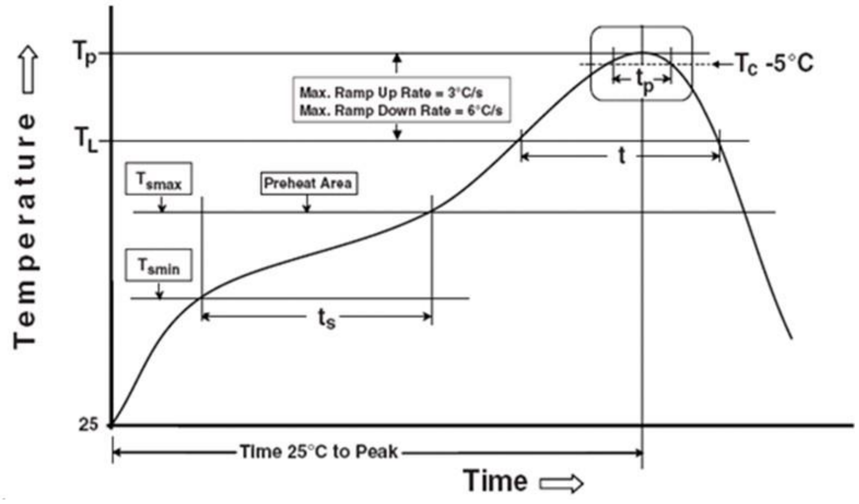


Dimension No.	Ao	Bo	Do	D1	E	F
Dimension (mm) S.S1	4.90±0.1	10.40±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.50±0.1
Dimension No.	**Po**	**P1**	**P2**	**t**	**W**	**Ko**
Dimension (mm) S.S1	4.00±0.1	8.00±0.1	2.00±0.1	0.40±0.1	16.00±0.3	4.60±0.1

Precautions for Use

1. Soldering Condition

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



Notes	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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