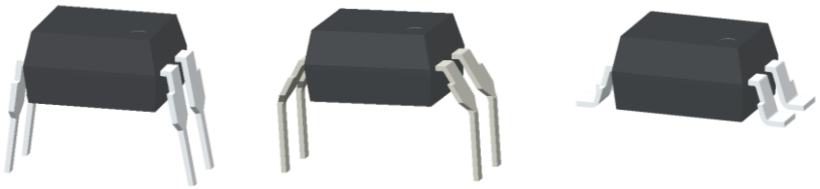
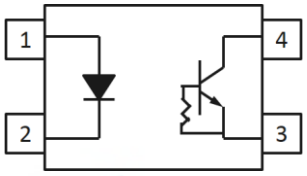
DATASHEET

4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER
EL2514-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: 50~200% at I_F = 5mA, V_{CE} = 5V, T_A =25°C)
- High isolation voltage between input and output (Viso = 5000Vrms)
- High-Speed switching (t_{on}≦25 μs at I_F=5mA,V_{CC}=5V,R_L=5kΩ, T_A =25°C)
  (t_{off}≦25 μs at I_F=5mA,V_{CC}=5V,R_L=5kΩ, T_A =25°C)
- Creepage distance > 7.62mm
- Operating temperature up to +110°C
- Compact small outline package
- Compliance with EU REACH
- The product itself will remain within RoHS compliant version
- UL and cUL (No.E214129)
- VDE approved (No.132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved
- CQC approved

Description

The EL2514-G series of devices each consist of an infrared emitting diodes, optically coupled to a phototransistor detector. The EL2514-G has enabled relatively high switching speed with high load resistor of several kΩ.
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
- Electronic electricity meter
- Telecommunication equipments
- Power supply

Absolute Maximum Ratings (Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	50	mA
	Peak Forward Current (1μs, pulse)	I_{FP}	0.5	A
	Reverse Voltage	V_R	6	V
Output	Collector Current	I_C	20	mA
	Collector-Emitter Voltage	V_{CEO}	40	V
	Emitter-Collector Voltage	V_{ECO}	0.45	V
Total Power Dissipation		P_{TOT}	200	mW
Isolation Voltage*1		V_{ISO}	5000	Vrms
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

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Input Current	I_F	5	6	7	mA

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 = 20mA
Reverse Current	I_R	-	-	10	μA	V_R = 4V
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}	-	-	100	nA	V_{CE} = 10V, I_F = 0mA
Collector-Emitter Breakdown Voltage	BV_{CEO}	40	-	-	V	I_C = 0.1mA
Emitter-Collector Breakdown Voltage	BV_{ECO}	0.45	-	-	V	I_E = 0.1mA

Transfer Characteristics

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer Ratio	CTR	50	-	200	%	I_F = 5mA ,V_{CE} = 5V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	-	0.35	V	I_F = 5mA ,I_C = 0.4mA
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
Turn-on Time	t_{on}	-	-	25	μs	V_{CC} = 5V, I_F = 5mA, R_L = 5kΩ
Turn-off Time	t_{off}	-	-	25	μs	

* Typical values at T_a = 25°C

Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs. Forward Voltage

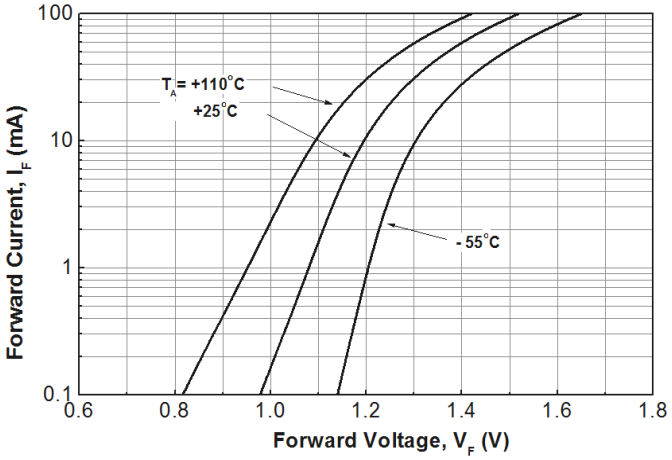


Figure 2. Current Transfer Ratio vs Forward Current

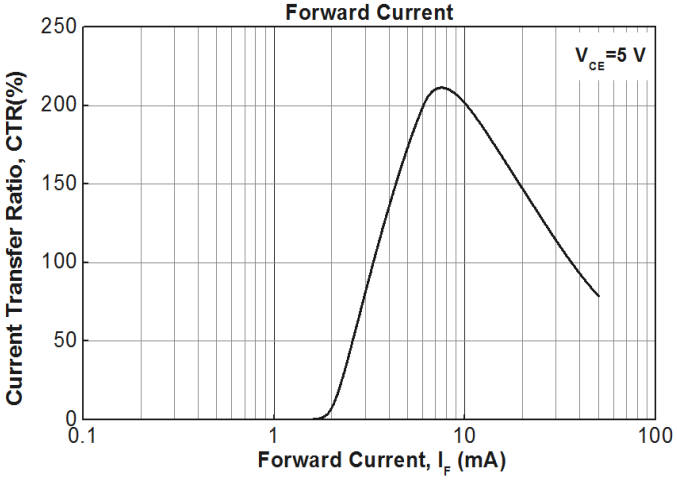


Figure 3. Current Transfer Ratio vs Ambient Temperature

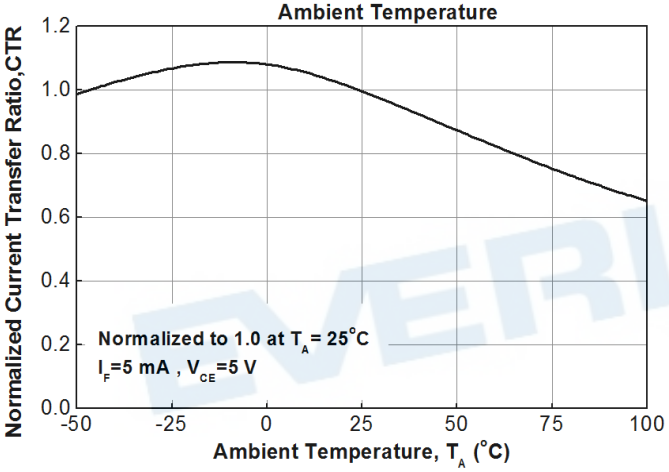


Figure 4. Dark Current vs Ambient Temperature

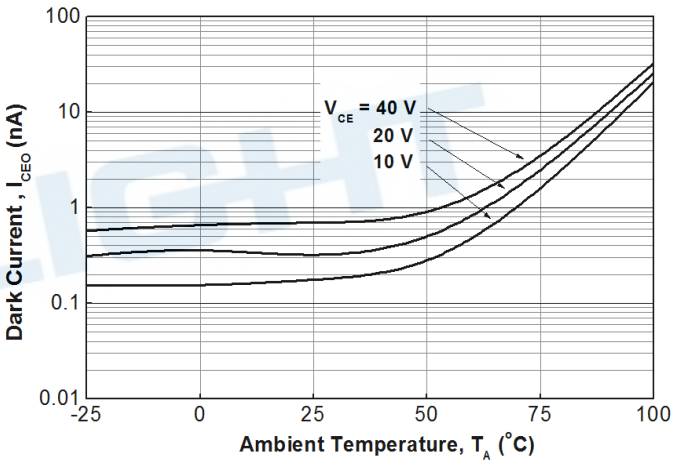


Figure 5. Collector Current vs Collector Saturation Voltage

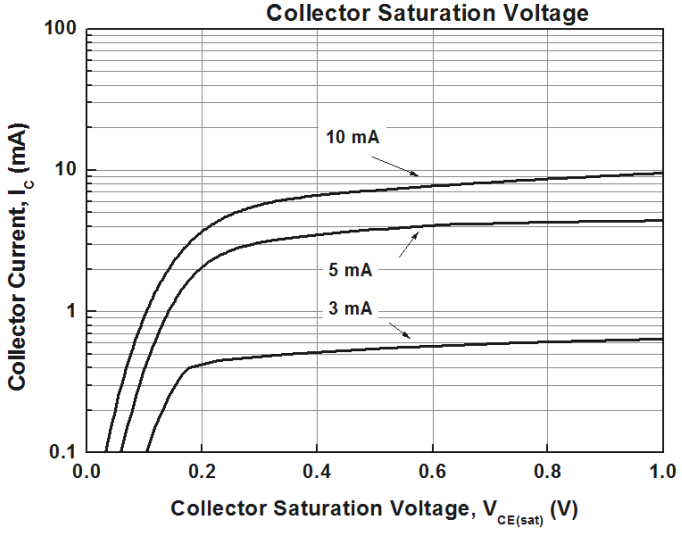
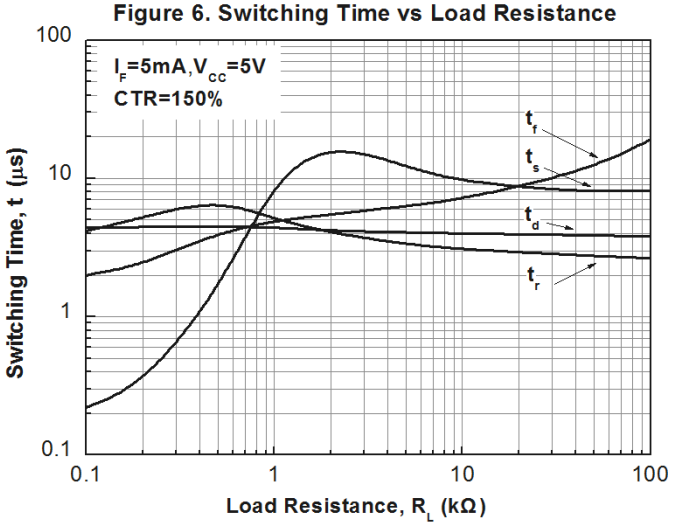


Figure 6. Switching Time vs Load Resistance



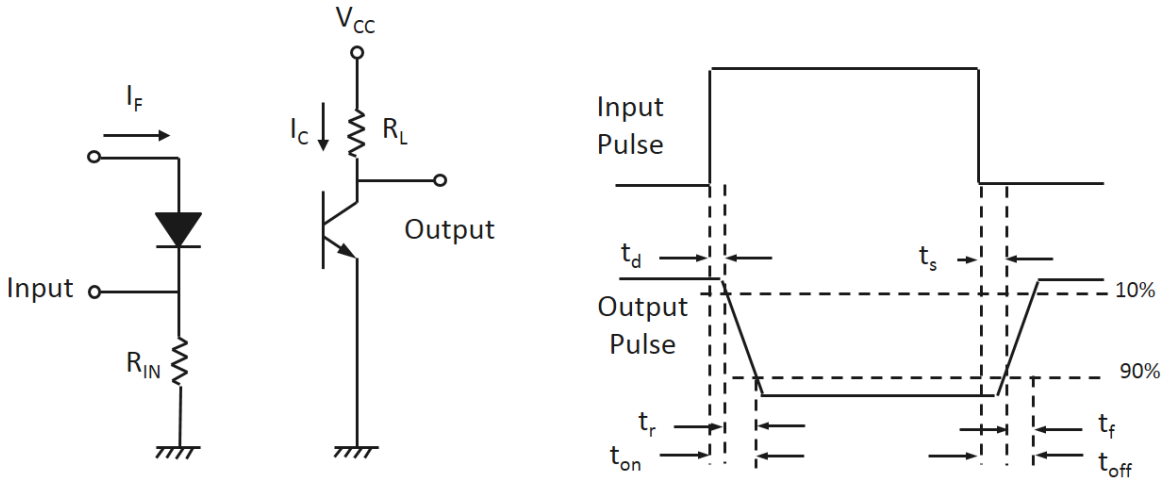


Figure 7. Switching Time Test Circuit & Waveforms

Order Information

Part Number

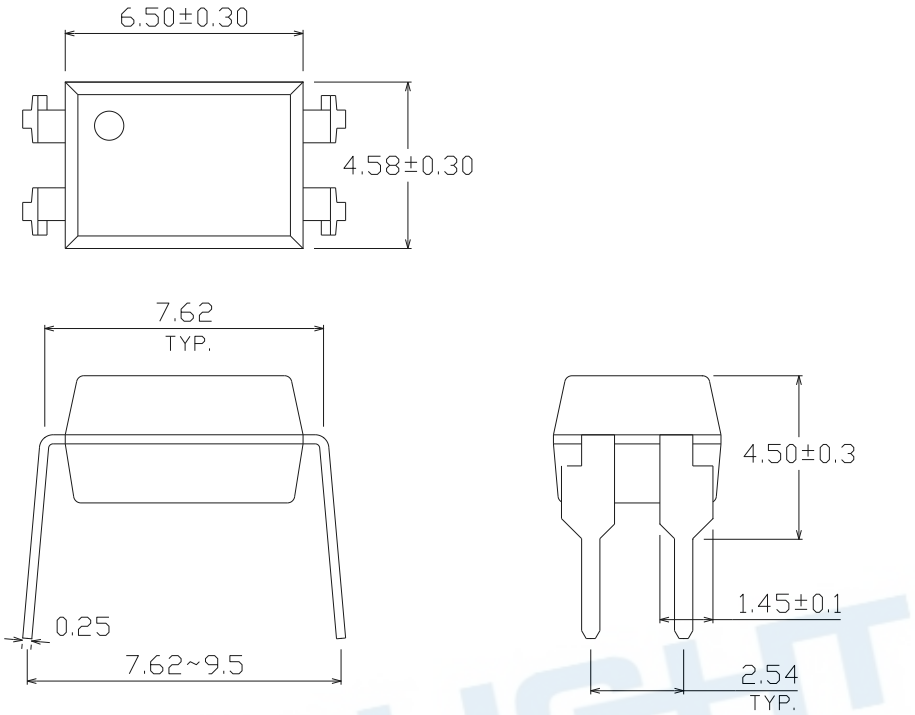
EL2514X(Y)-VG

Note
X = Lead form option (S1, S2, M or none)
Y = Tape and reel option (TU, TD or none)
V = VDE safety (optional)
G = Halogens free

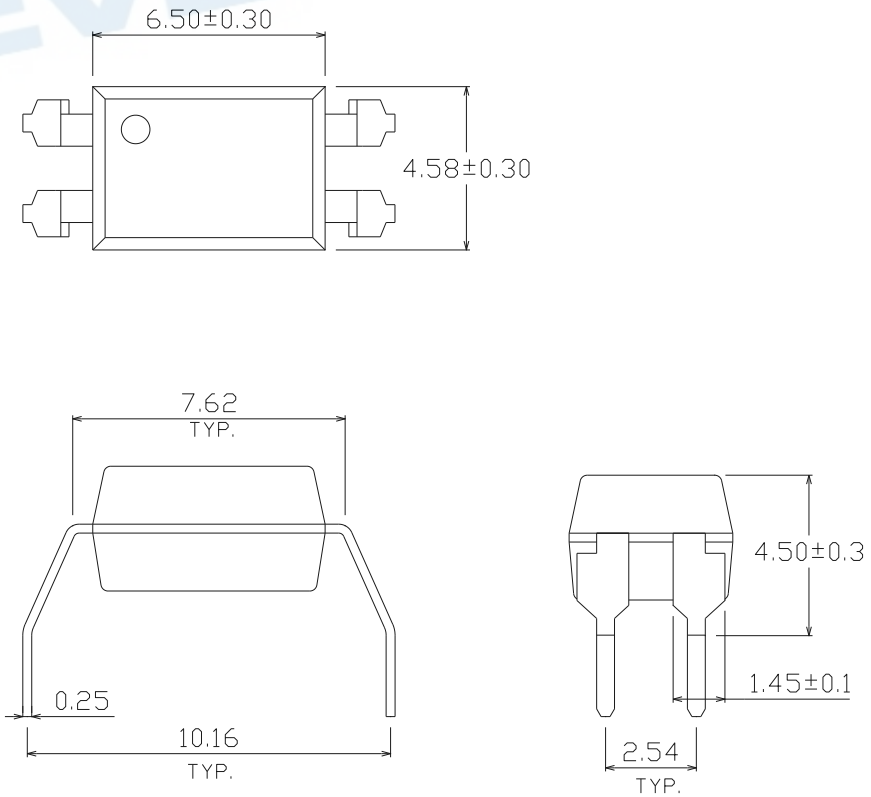
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S1 (TU)	Surface mount lead form (low profile) + TU tape & reel option	1500 units per reel
S1 (TD)	Surface mount lead form (low profile) + TD tape & reel option	1500 units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

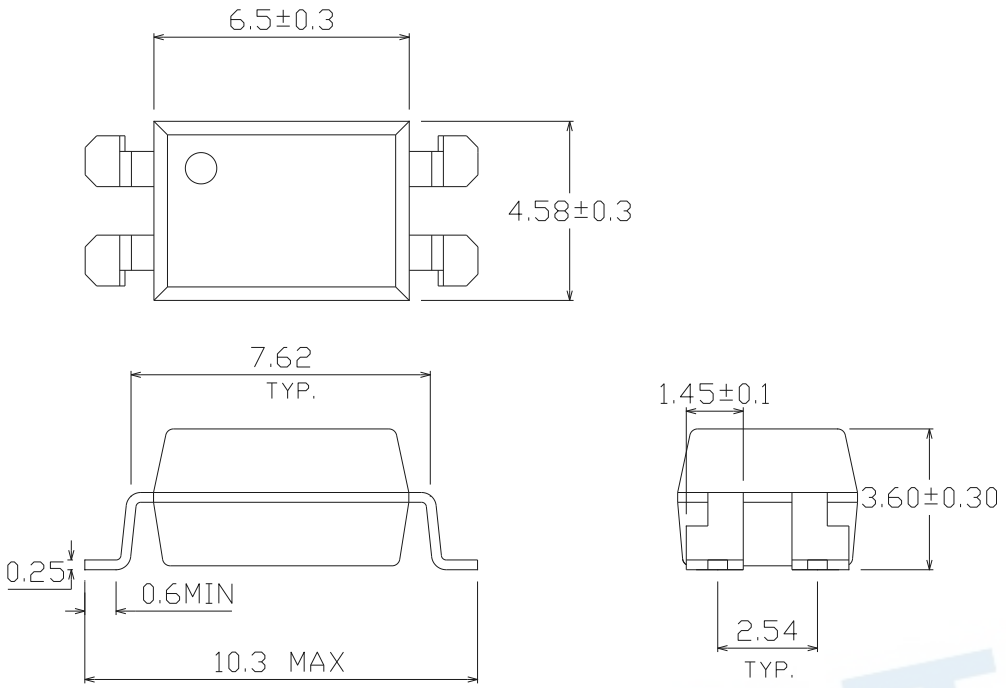
Standard DIP Type



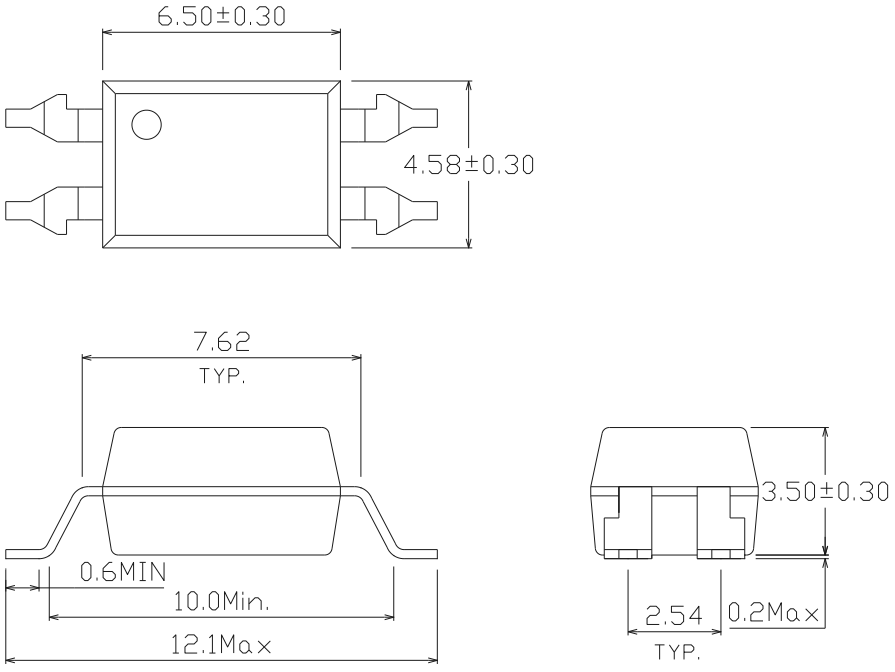
Option M Type



Option S1 Type

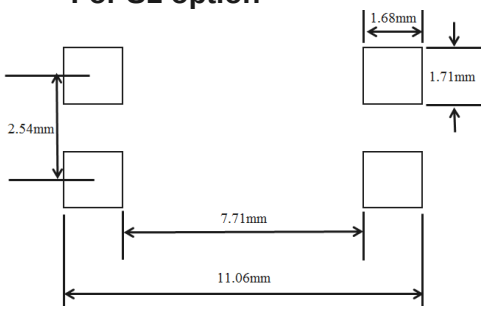


Option S2 Type

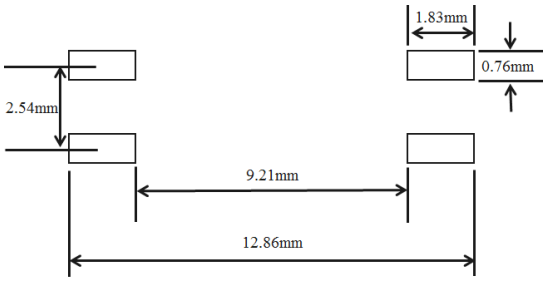


Recommended pad layout for surface mount leadform

For S1 option



For S2 option



Notes

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

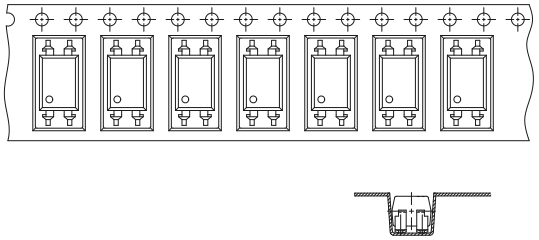
Device Marking

Notes

EL	denotes EVERLIGHT
2514	denotes Device Number
G	denotes Green part
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

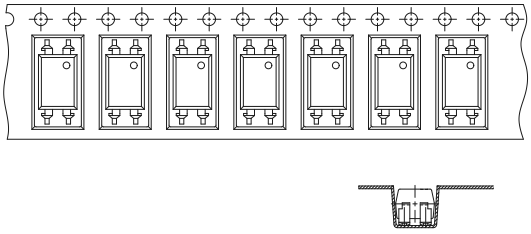
Tape & Reel Packing Specifications

Option TD



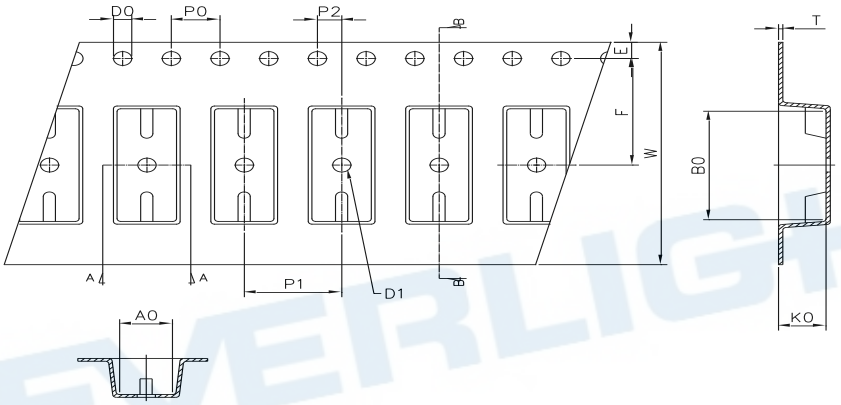
Direction of feed from reel

Option TU



Direction of feed from reel

Tape dimensions

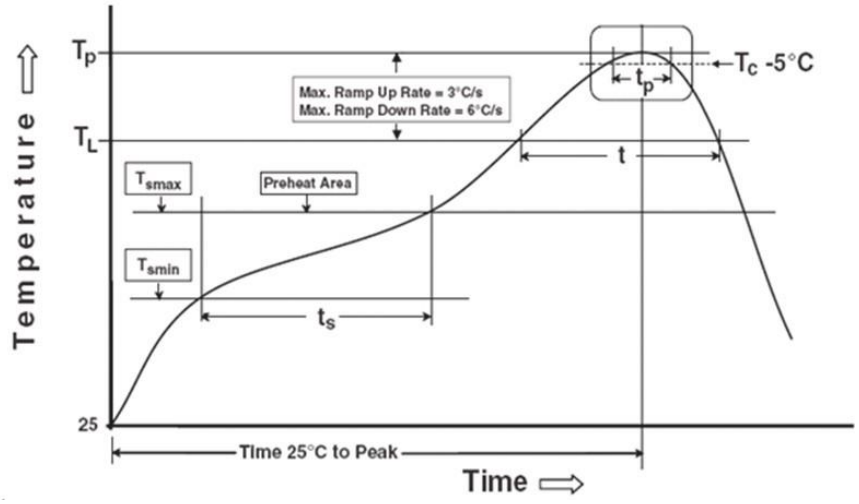


Dimension No.	Ao	Bo	Do	D1	E	F
Dimension (mm) S1	4.90±0.1	10.40±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.50±0.1
Dimension (mm) S2	4.88±0.1	12.55±0.1	1.5±0.1	1.50±0.1	1.75±0.1	11.5±0.1
Dimension No.	**Po**	**P1**	**P2**	**t**	**W**	**Ko**
Dimension (mm) S1	4.00±0.1	8.00±0.1	2.00±0.1	0.40±0.1	16.00±0.3	4.60±0.1
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 (Tsmin to Tsmax) (ts)	60-120 seconds
Average ramp-up rate (Tsmax to Tp)	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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