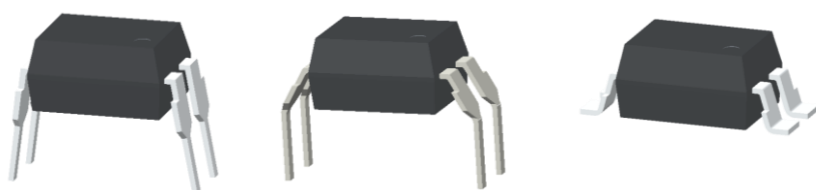
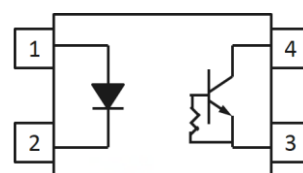


4 PIN DIP PHOTOTRANSISTOR PHOTOCOUPLER EL2514-G Series



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 $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$, $T_A = 25^\circ\text{C}$)
- High isolation voltage between input and output (Viso = 5000Vrms)
- High-Speed switching ($t_{on} \leq 25 \mu\text{s}$ at $I_F = 5\text{mA}$, $V_{CC} = 5\text{V}$, $R_L = 5\text{k}\Omega$, $T_A = 25^\circ\text{C}$)
($t_{off} \leq 25 \mu\text{s}$ at $I_F = 5\text{mA}$, $V_{CC} = 5\text{V}$, $R_L = 5\text{k}\Omega$, $T_A = 25^\circ\text{C}$)
- Creepage distance > 7.62mm
- Operating temperature up to $+110^\circ\text{C}$
- 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 k Ω .

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°C)

	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	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

Recommended Operating Conditions

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

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	$V_{CE} = 10\text{V}, I_F = 0\text{mA}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	40	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector Breakdown Voltage	BV_{ECO}	0.45	-	-	V	$I_E = 0.1\text{mA}$

Transfer Characteristics

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer Ratio	CTR	50	-	200	%	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	-	0.35	V	$I_F = 5\text{mA}, I_C = 0.4\text{mA}$
Isolation Resistance	R_{IO}	5×10^{10}	-	-	Ω	$V_{IO} = 500\text{Vdc}$, 40~60% R.H.
Floating Capacitance	C_{IO}	-	0.6	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$
Turn-on Time	t_{on}	-	-	25	μs	$V_{CC} = 5\text{V}, I_F = 5\text{mA}$, $R_L = 5\text{k}\Omega$
Turn-off Time	t_{off}	-	-	25	μs	

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

Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs. Forward Voltage

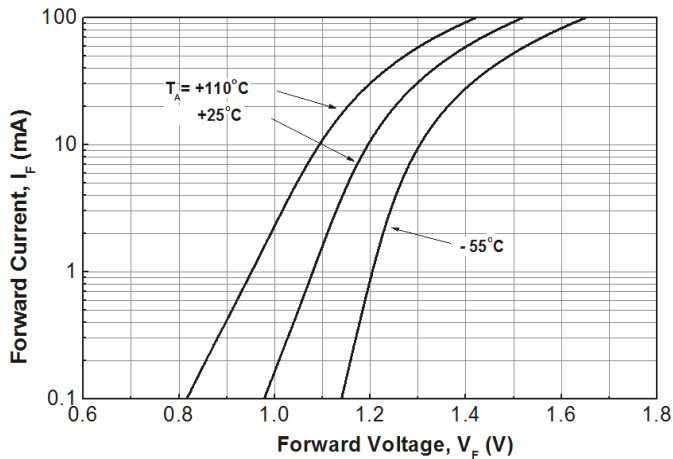


Figure 2. Current Transfer Ratio vs Forward Current

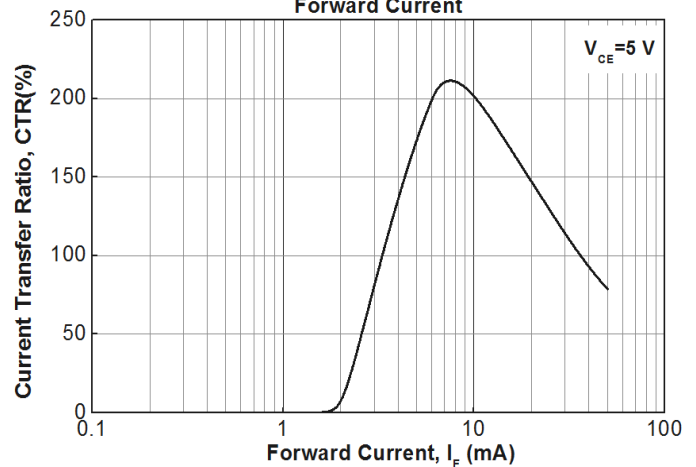


Figure 3. Current Transfer Ratio vs Ambient Temperature

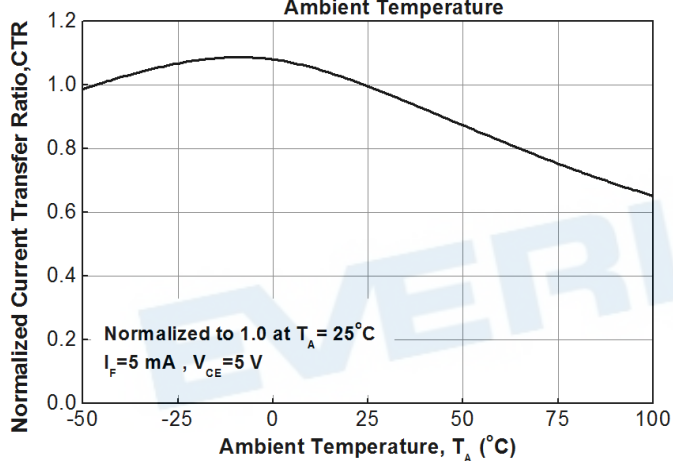


Figure 4. Dark Current vs Ambient Temperature

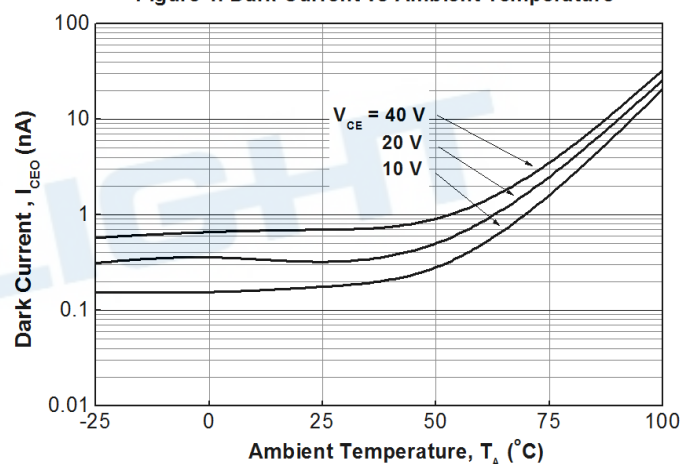


Figure 5. Collector Current vs Collector Saturation Voltage

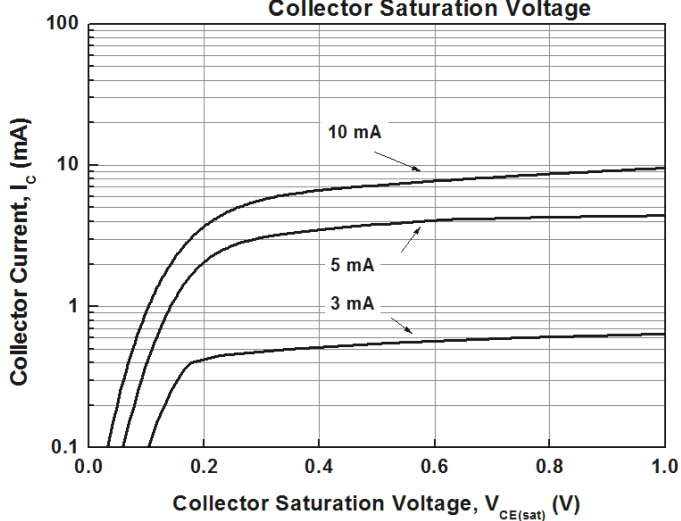
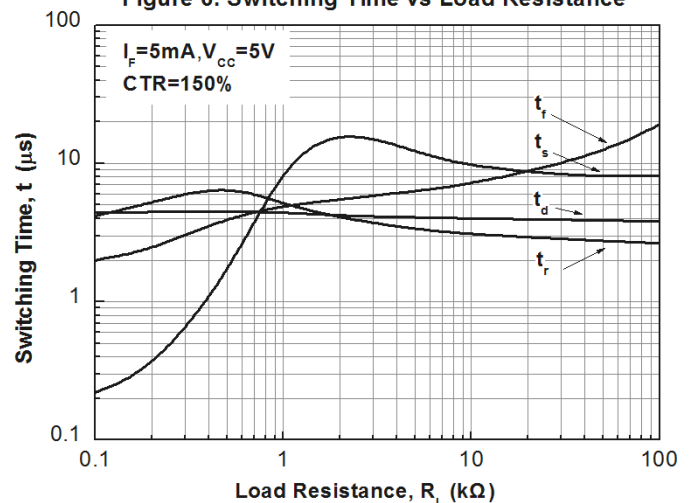


Figure 6. Switching Time vs Load Resistance



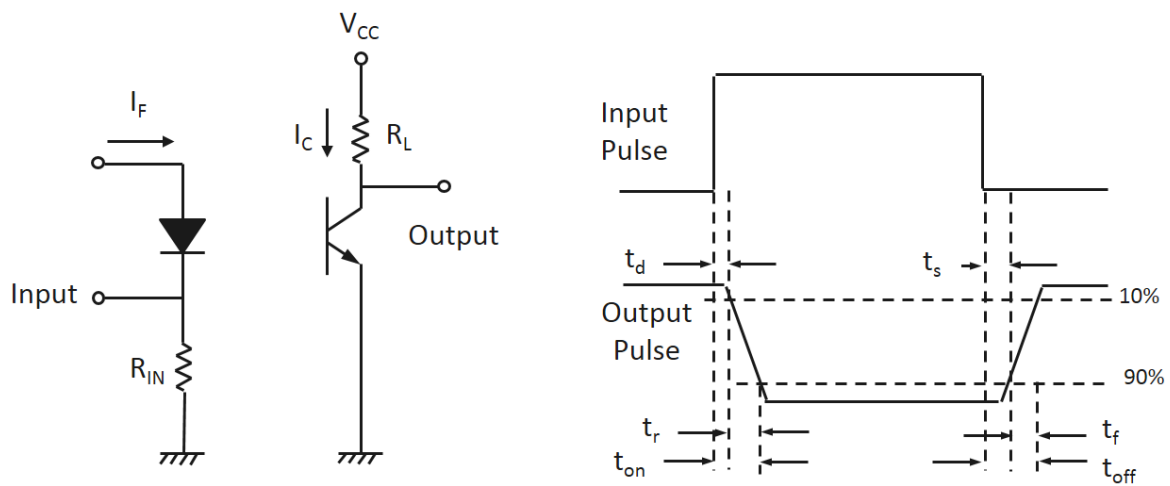


Figure 7. Switching Time Test Circuit & Waveforms

EVERLIGHT

Order Information

Part Number

EL2514X(Y)-VG

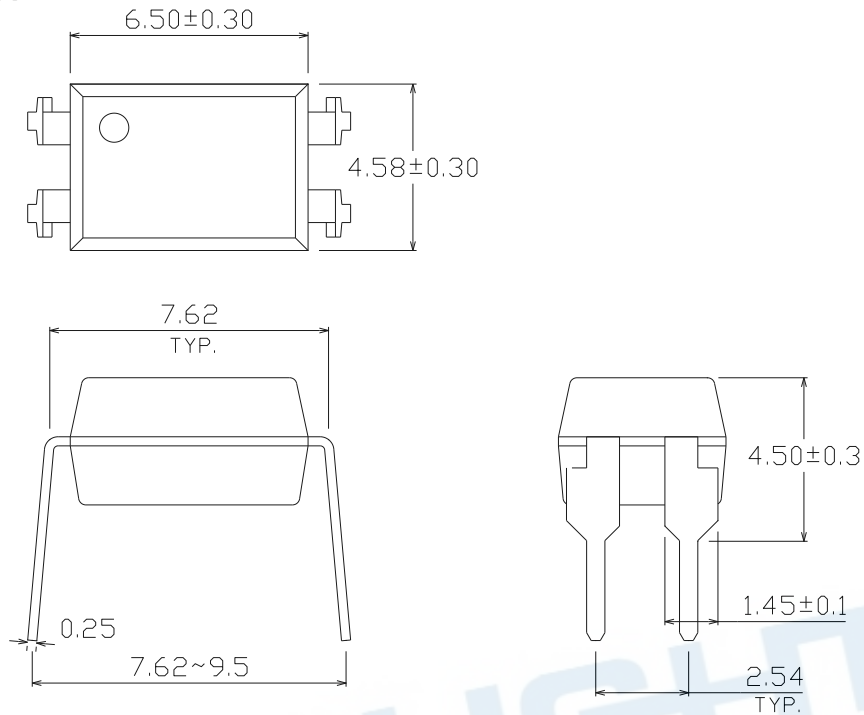
Note

- 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

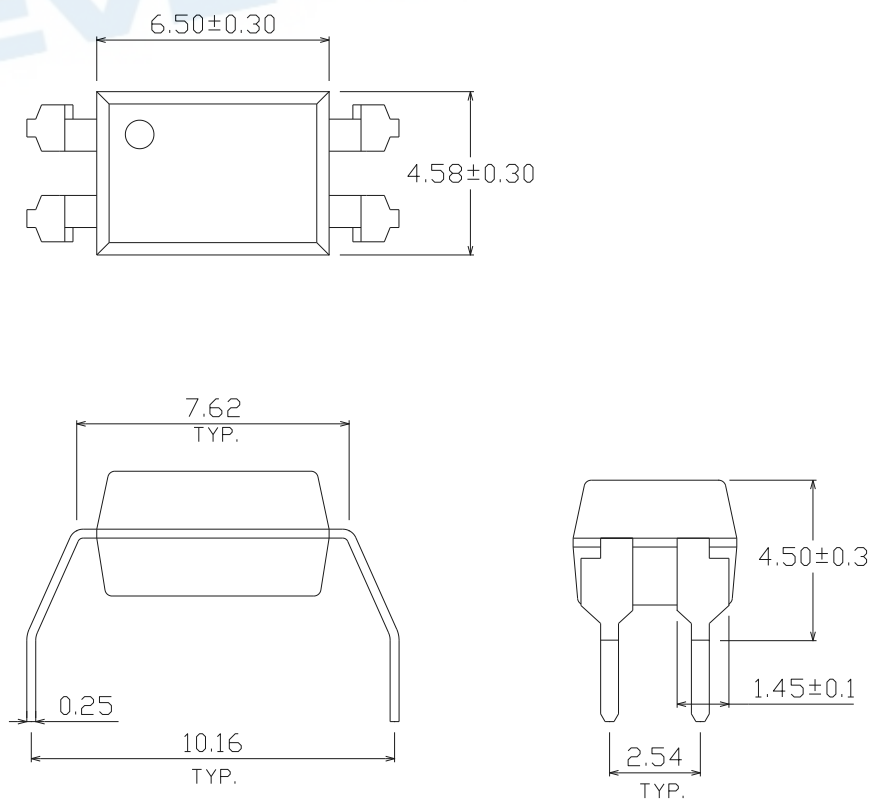
Option	Description	Packing quantity
None	Standard DIP-4	100 units per tube
M	Wide lead bend (0.4 inch spacing)	100 units per tube
S1 (TU)	Surface mount lead form (low profile) + TU tape & reel option	1500 units per reel
S1 (TD)	Surface mount lead form (low profile) + TD tape & reel option	1500 units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

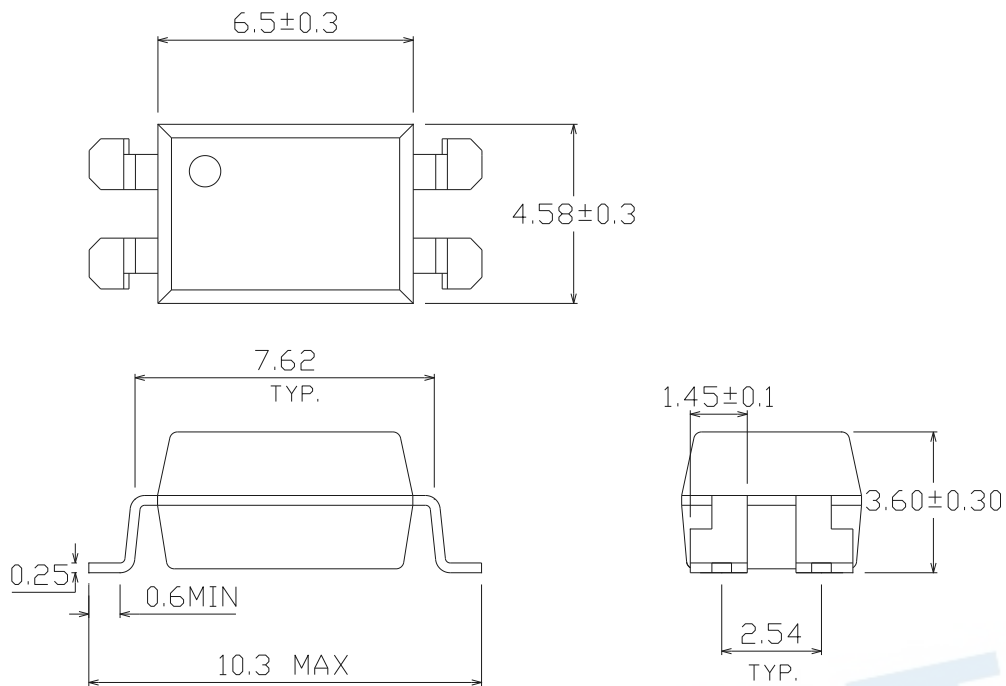
Standard DIP Type



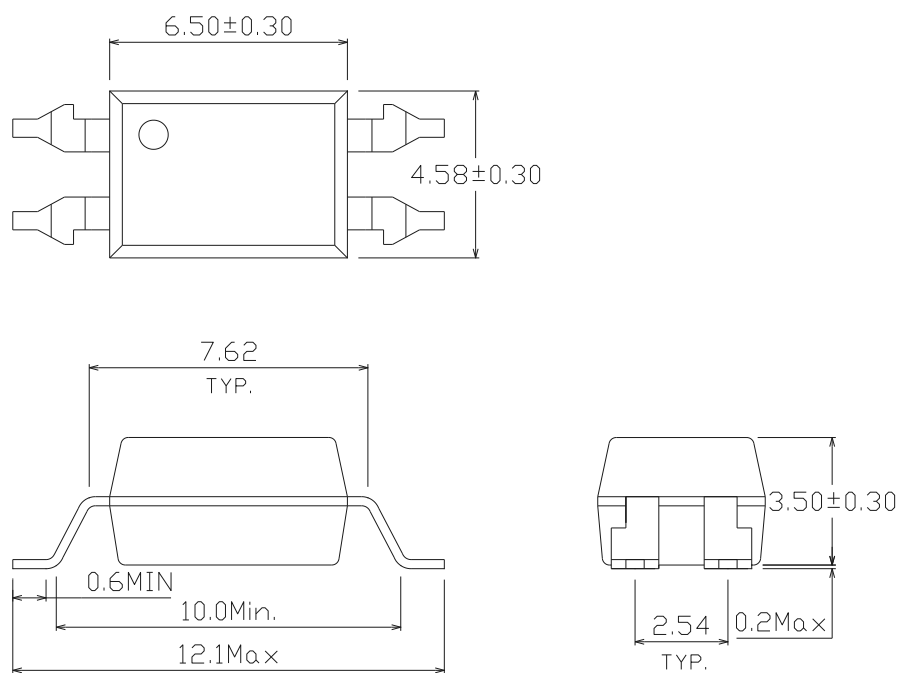
Option M Type



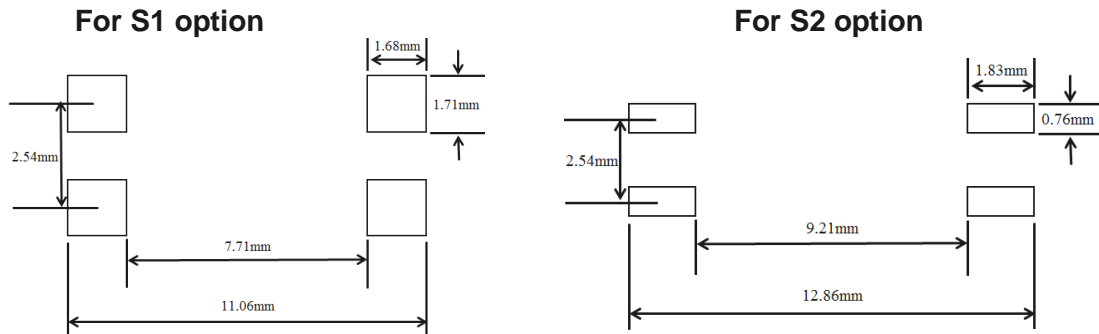
Option S1 Type



Option S2 Type



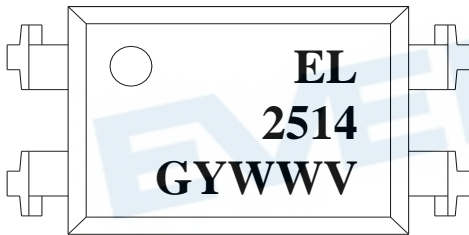
Recommended pad layout for surface mount leadform



Notes

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

Device Marking

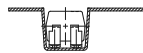
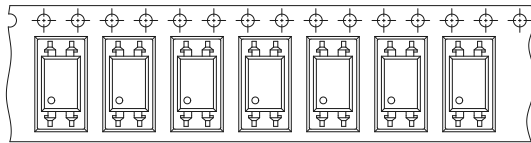


Notes

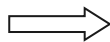
EL denotes EVERLIGHT
2514 denotes Device Number
G denotes Green part
Y denotes 1 digit Year code
WW denotes 2 digit Week code
V denotes VDE (optional)

Tape & Reel Packing Specifications

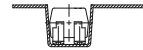
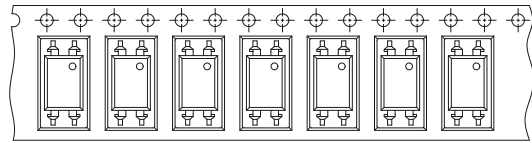
Option TD



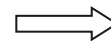
Direction of feed from reel



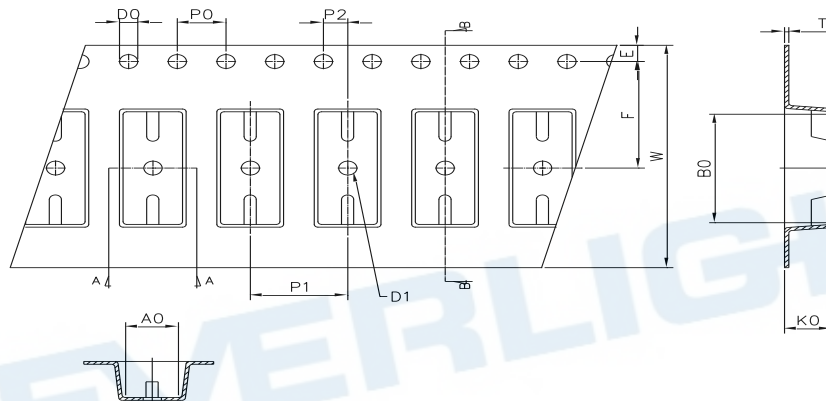
Option TU



Direction of feed from reel



Tape dimensions

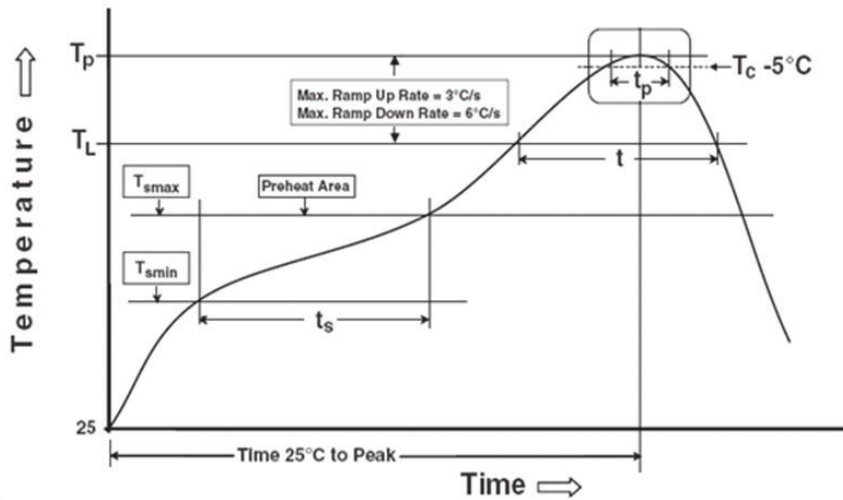


Dimension No.	Ao	Bo	Do	D1	E	F
Dimension (mm) S1	4.90±0.1	10.40±0.1	1.5±0.1	1.50±0.1	1.75±0.1	7.50±0.1
Dimension (mm) S2	4.88±0.1	12.55±0.1	1.5±0.1	1.50±0.1	1.75±0.1	11.5±0.1
Dimension No.	Po	P1	P2	t	W	Ko
Dimension (mm) S1	4.00±0.1	8.00±0.1	2.00±0.1	0.40±0.1	16.00±0.3	4.60±0.1
Dimension (mm) S2	4.00±0.1	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 (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: $T_p - 5^\circ C$	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

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.
3. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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