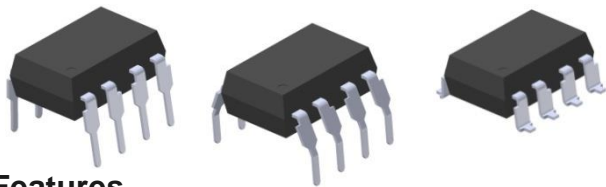




THE DATASHEET OF EL2631



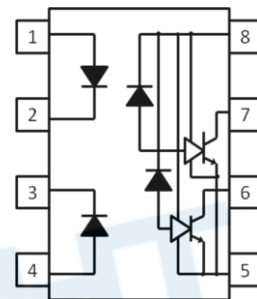
8 PIN DIP HIGH SPEED 10MBit/s LOGIC GATE PHOTOCOUPLER EL263X series



Features

- High speed 10Mbit/s
- 10kV/μs min. common mode transient immunity (EL2631)
- Guaranteed performance from -40 to 85°C
- Logic gate output
- High isolation voltage between input and output (Viso=5000 Vrms)
- Pb free and RoHS compliant.
- UL and cUL approved(No. E214129)
- VDE approved (No. 132249)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved

Schematic



A 0.1μF bypass capacitor must be connected between pins 8 and 5 *3

Pin Configuration

1. Anode
2. Cathode
3. Cathode
4. Anode
5. Gnd
6. V_{out 2}
7. V_{out 1}
8. V_{CC}

Description

The EL2630 and EL2631 are consists of an infrared emitting diode optically coupled to a high speed integrated photo detector logic gate with a strobable output. It is packaged in a 8-pin DIP package and available in wide-lead spacing and SMD options.

Applications

- Ground loop elimination
- LSTTL to TTL, LSTTL or 5 volt CMOS
- 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_A=25°C)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I _F	20	mA
	Reverse voltage	V _R	5	V
	Power dissipation	P _D	40	mW
Output	Power dissipation	P _C	60	mW
	Output current	I _O	50	mA
	Output voltage	V _O	7.0	V
	Supply voltage	V _{CC}	7.0	V
	Output Power Dissipation	P _O	85	mW
	Isolation voltage *1	V _{ISO}	5000	V _{rms}
	Operating temperature	T _{OPR}	-40~+100	°C
	Storage temperature	T _{STG}	-55~+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, 3 & 4 are shorted together, and pins 5, 6, 7 & 8 are shorted together.

*2 For 10 seconds.

Electrical Characteristics (T_A =-40 to 85°C unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward voltage	V _F	-	1.4	1.8	V	I _F = 10mA, T _A =25°C
Reverse voltage	V _R	5.0	-	-	V	I _R = 10μA
Temperature coefficient of forward voltage	ΔV _F /ΔT _A	-	-1.8	-	mV/°C	I _F =10mA
Input capacitance	C _{IN}	-	60	-	pF	V _F =0, f=1MHz

Output

Parameter	Symbol	Min	Typ.*	Max.	Unit	Condition
High level supply current	I _{CCH}	-	12.5	18	mA	I _F =0mA, V _{CC} =5.5V
Low level supply current	I _{CCL}	-	14.5	21	mA	I _F =10mA, V _{CC} =5.5V

Transfer Characteristics (T_A =-40 to 85°C unless specified otherwise)

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
HIGH Level Output Current	I _{OH}	-	2.1	100	μA	V _{CC} =5.5V, V _O =5.5V, I _F =250μA
LOW Level Output Current	V _{OL}	-	0.35	0.6	V	V _{CC} = 5.5V, I _F =5mA, I _{CL} =13mA
Input Threshold Current	I _{FT}	-	2.5	5	mA	V _{CC} = 5.5V, V _O =0.6V, I _{OL} =13mA

Switching Characteristics (T_A =-40 to 85°C, V_{CC}=5V, I_F=7.5mA unless specified otherwise)

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Propagation delay time to output High level* ⁴ (Fig.12)	T _{PLH}	-	35	100	ns	C _L = 15pF, R _L =350Ω, T _A =25°C
Propagation delay time to output Low level* ⁵ (Fig.12)	T _{PHL}	-	40	100	ns	C _L = 15pF, R _L =350Ω, T _A =25°C
Pulse width distortion	T _{PHL} -T _{PLH}	-	5	35	ns	C _L = 15pF, R _L =350Ω
Output rise time* ⁶ (Fig.12)	t _r	-	40	-	ns	C _L = 15pF, R _L =350Ω
Output fall time* ⁷ (Fig.12)	t _f	-	10	-	ns	C _L = 15pF, R _L =350Ω

Switching Characteristics ($T_A = -40$ to 85°C , $V_{CC}=5\text{V}$, $I_F=7.5\text{mA}$ unless specified otherwise)

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Common Mode Transient Immunity at Logic High ^{*8}	EL2630	5,000	-	-	V/ μS	$I_F = 0\text{mA}$, $V_{CM}=1\text{KV}_{p-p}$, $V_{OH}=2.0\text{V}$, $R_L=350\Omega$, $T_A=25^\circ\text{C}$ (Fig.13)
	EL2631	10,000	20,000	-		$I_F = 0\text{mA}$, $V_{CM}=1\text{KV}_{p-p}$, $V_{OH}=2.0\text{V}$, $R_L=350\Omega$, $T_A=25^\circ\text{C}$ (Fig.13)
Common Mode Transient Immunity at Logic Low ^{*9}	EL2630	5,000	-	-	V/ μS	$I_F = 7.5\text{mA}$, $V_{CM}=1\text{KV}_{p-p}$, $V_{OL}=0.8\text{V}$, $R_L=350\Omega$, $T_A=25^\circ\text{C}$ (Fig.13)
	EL2631	10,000	20,000	-		$I_F = 7.5\text{mA}$, $V_{CM}=1\text{KV}_{p-p}$, $V_{OL}=0.8\text{V}$, $R_L=350\Omega$, $T_A=25^\circ\text{C}$ (Fig.13)

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Typical Electro-Optical Characteristics Curves

Figure 1. Forward Current vs Forward Voltage

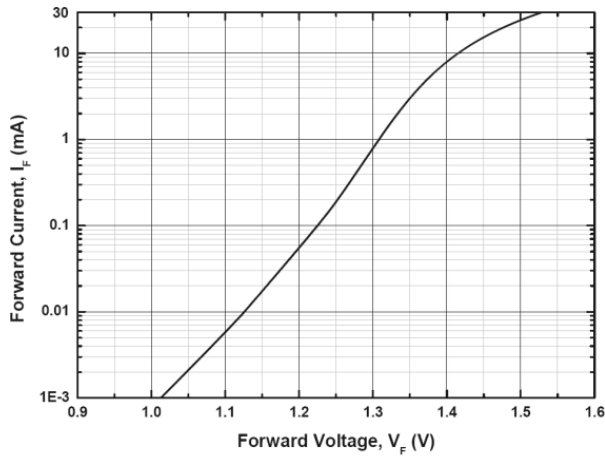


Figure 2. Low Level Output Voltage vs Ambient Temperature

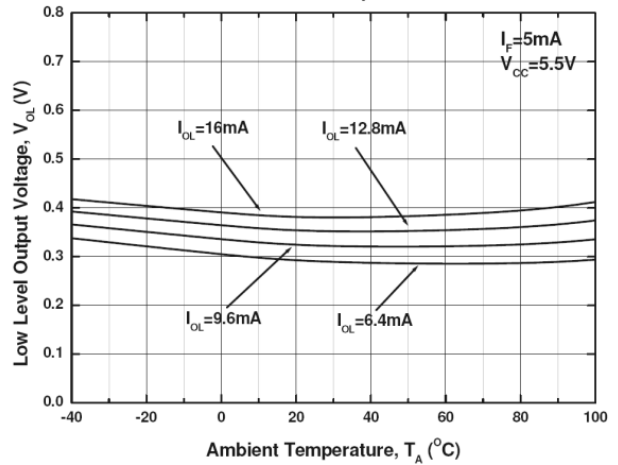


Figure 3. Low Level Output Current vs Ambient Temperature

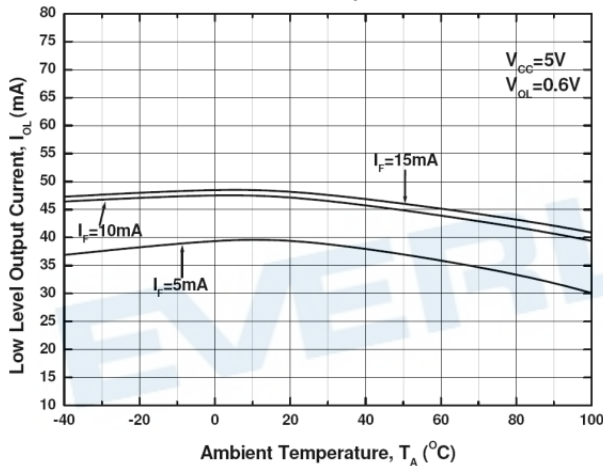


Figure 4. Input Threshold Current vs Ambient Temperature

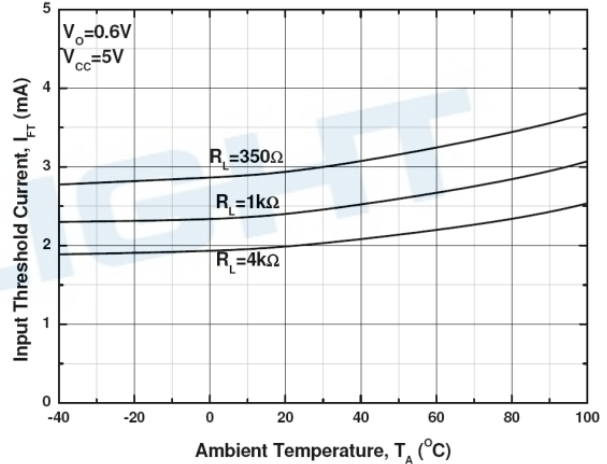


Figure 5. Input Current vs Output Voltage

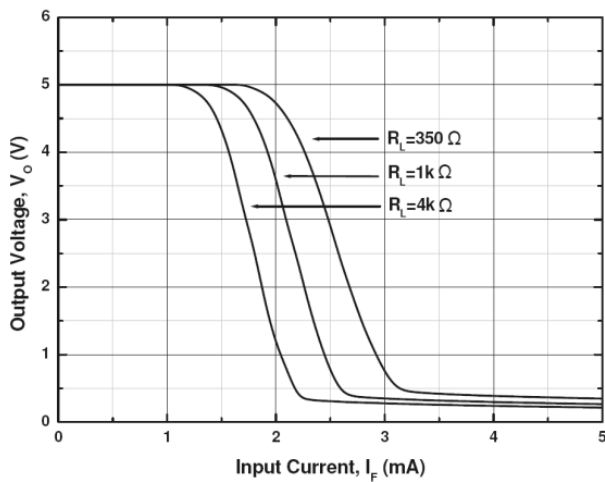


Figure 6. High Level Output Current vs Ambient Temperature

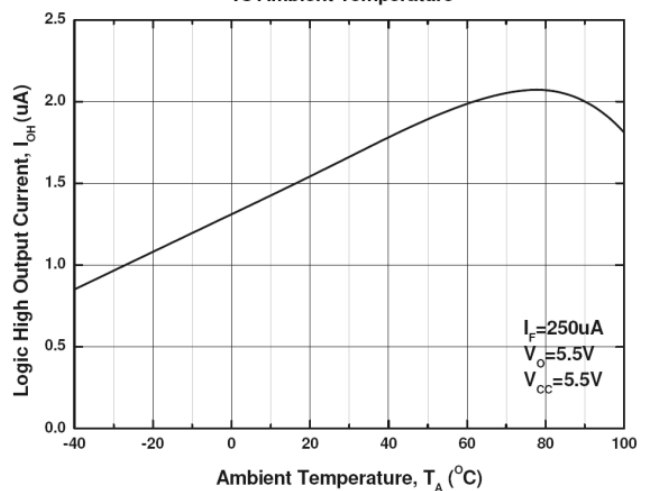


Figure 7. Propagation Delay vs. Forward Current

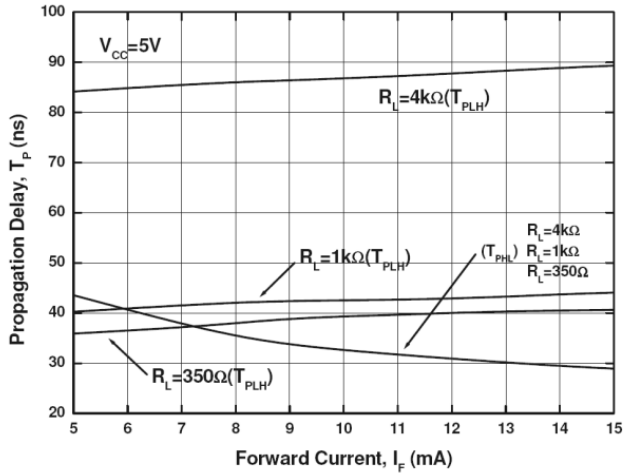


Figure 8. Propagation Delay vs. Temperature

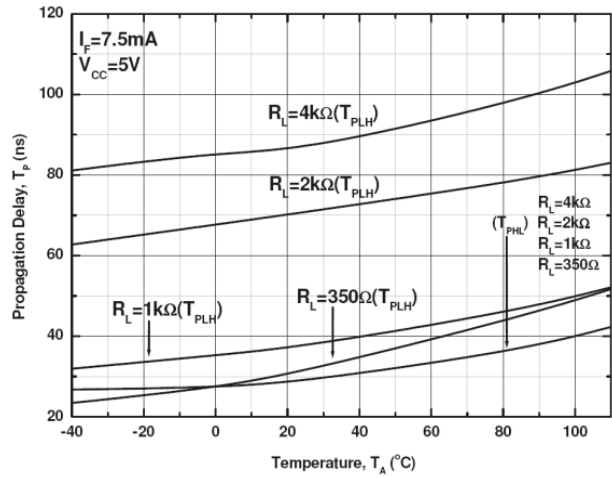


Figure 9. Pulse Width Distortion vs. Temperature

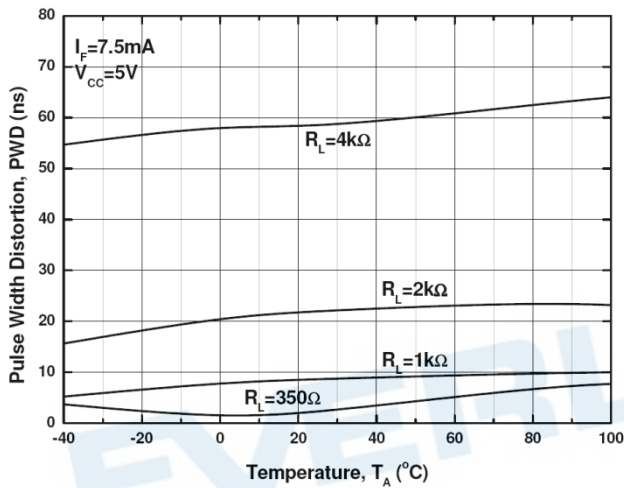


Figure 10. Rise and Fall Time vs. Temperature

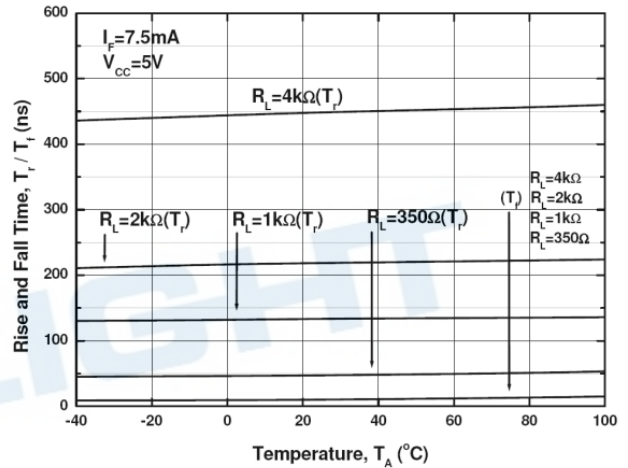


Fig. 11 Test circuit and waveforms for t_{PHL}, t_{PLH}, t_r, and t_f

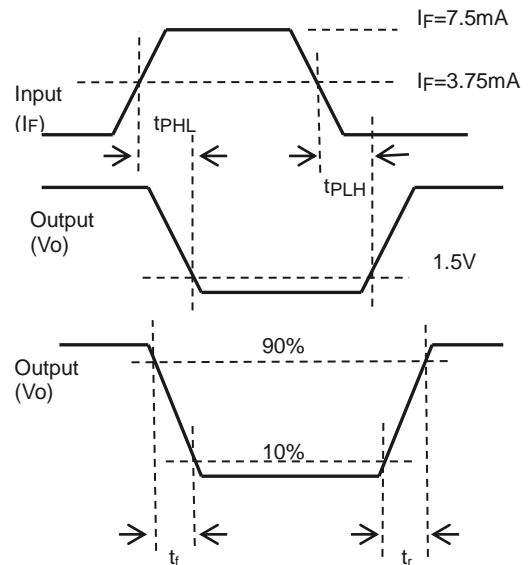
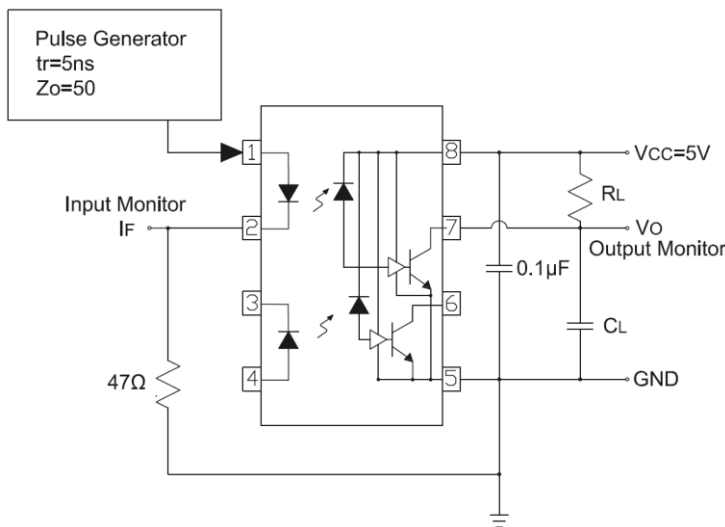
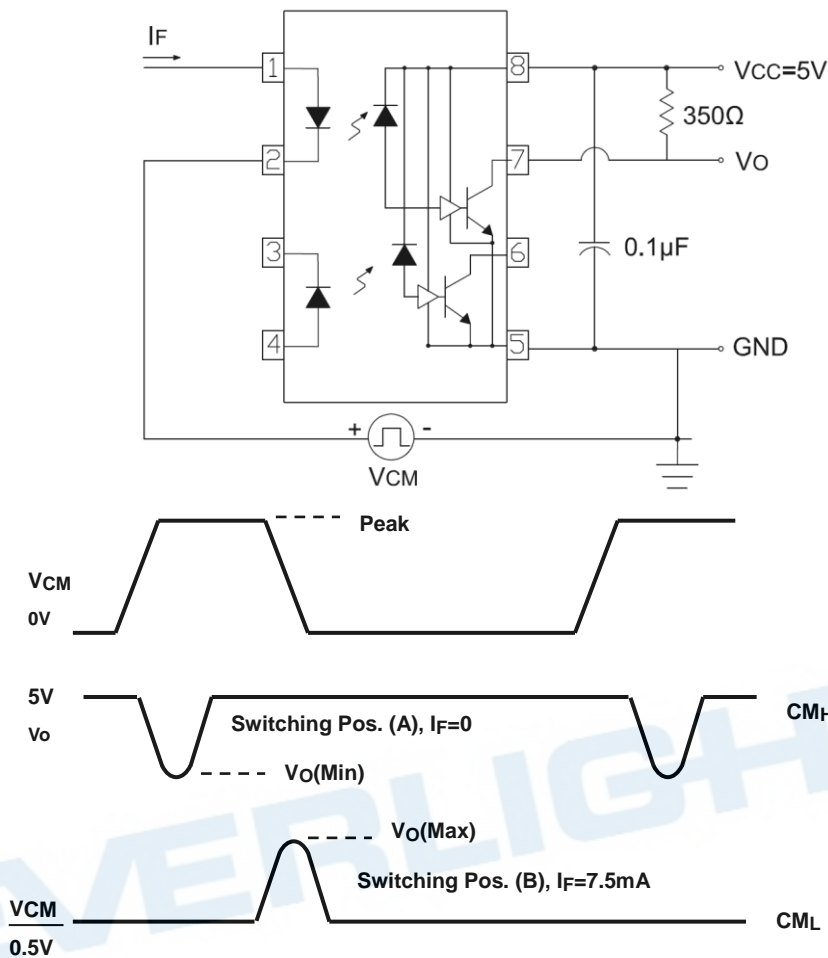


Fig. 12 Test circuit Common mode Transient Immunity



Note

- *3 The VCC 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 VCC and GND pins
- *4. tPLH – Propagation delay is measured from the 3.75mA level on the HIGH to LOW transition of the input current pulse to the 1.5 V level on the LOW to HIGH transition of the output voltage pulse.
- *5. tPHL – Propagation delay is measured from the 3.75mA level on the LOW to HIGH transition of the input current pulse to the 1.5 V level on the HIGH to LOW transition of the output voltage pulse.
- *6. tr – Rise time is measured from the 90% to the 10% levels on the LOW to HIGH transition of the output pulse.
- *7. tf – Fall time is measured from the 10% to the 90% levels on the HIGH to LOW transition of the output pulse.
- *8 CMH– The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the HIGH state (i.e., VOUT > 2.0V).
- *9 CML– The maximum tolerable rate of rise of the common mode voltage to ensure the output will remain in the LOW output state (i.e., VOUT < 0.8V).

Order Information

Part Number

EL263XY(Z)-V

Note

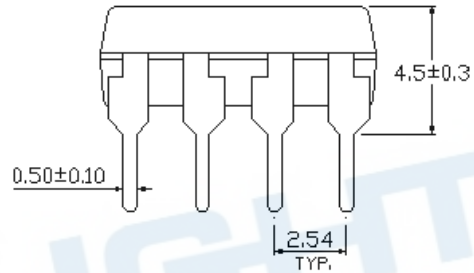
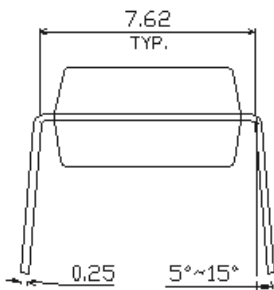
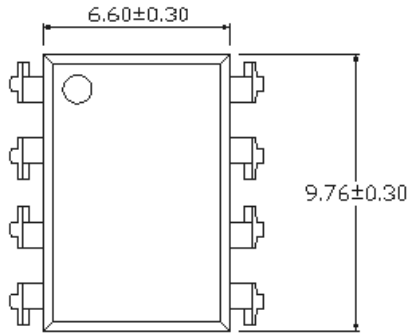
- X = (0 or 1) for EL26 part no.
- Y = Lead form option (S, S1, M or none)
- Z = Tape and reel option (TA, TB or none).
- V = VDE (optional)

Option	Description	Packing quantity
None	Standard DIP-8	45 units per tube
M	Wide lead bend (0.4 inch spacing)	45 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

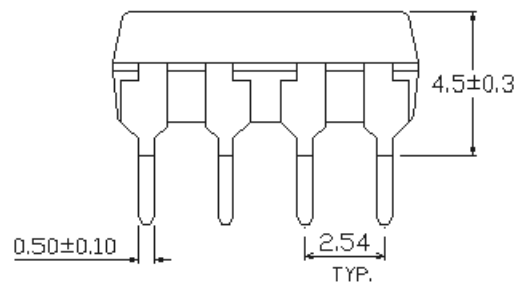
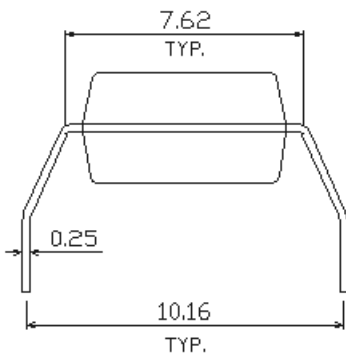
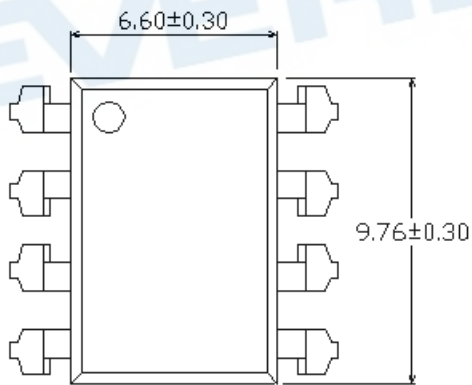
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Package Dimension
(Dimensions in mm)

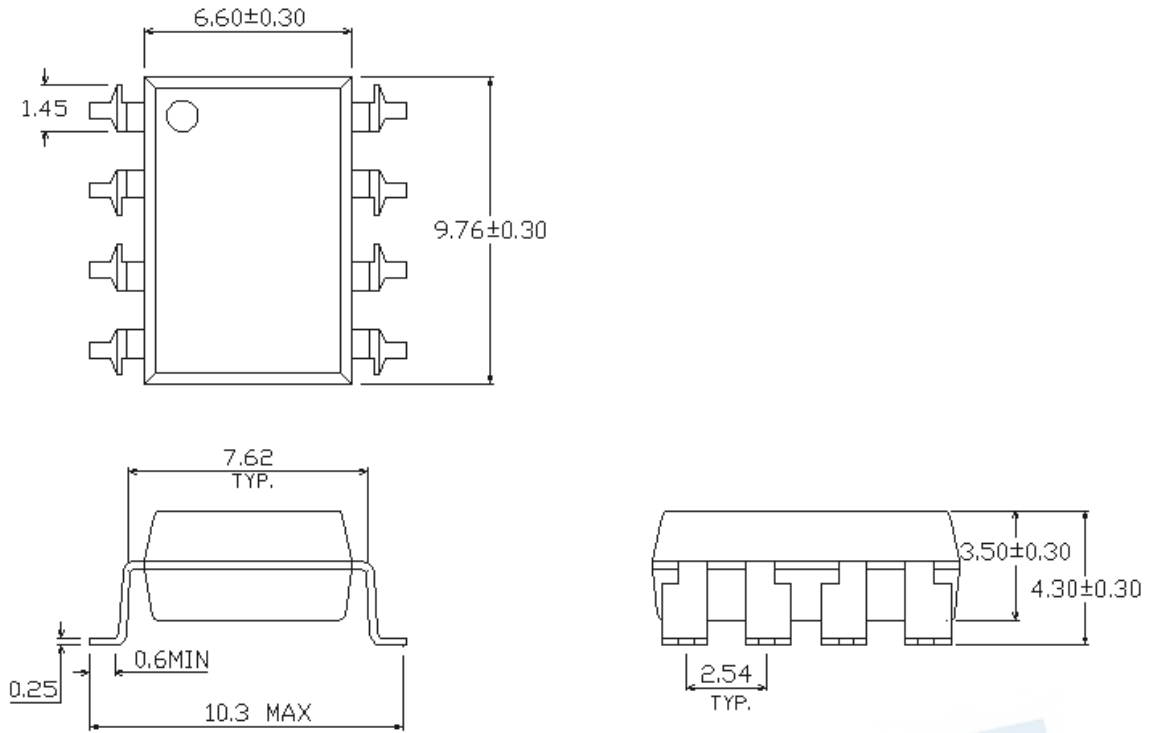
Standard DIP Type



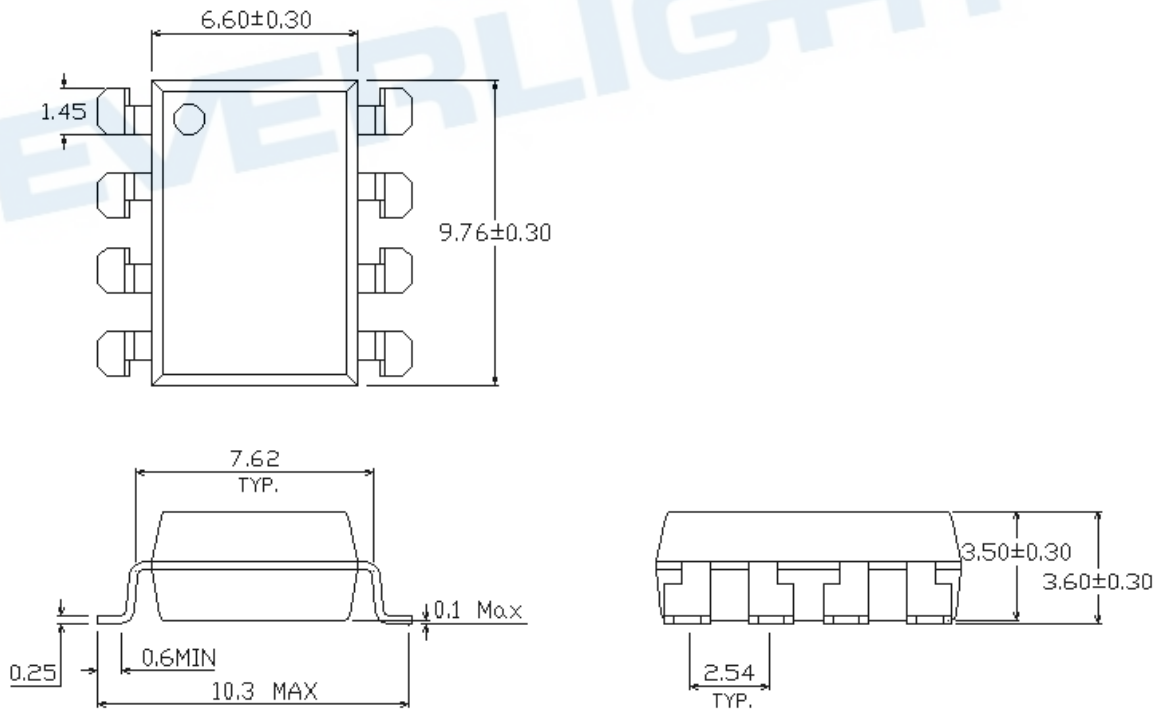
Option M Type



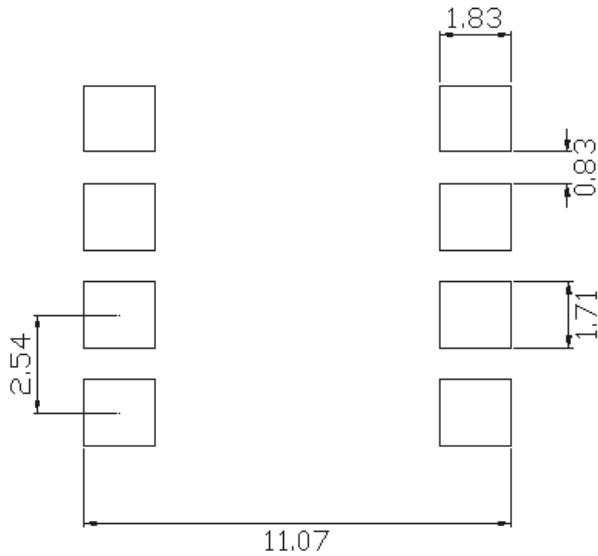
Option S Type



Option S1 Type



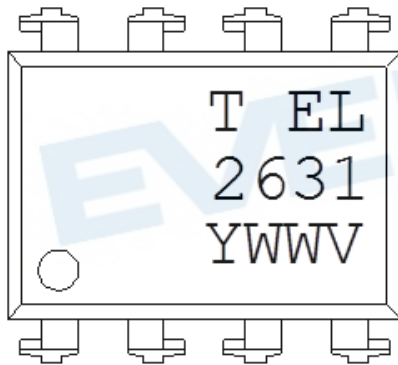
Recommended pad layout for surface mount leadform



Notes.

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

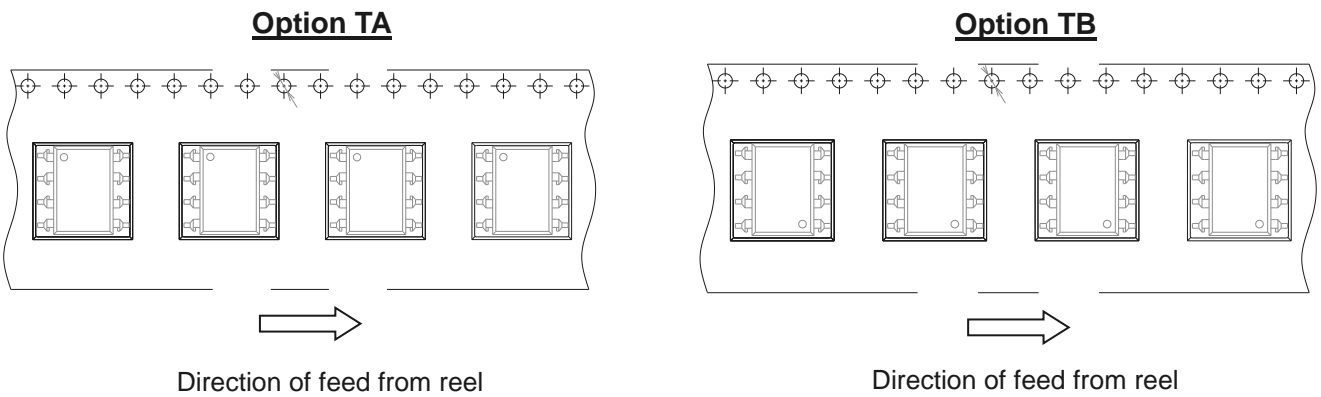
Device Marking



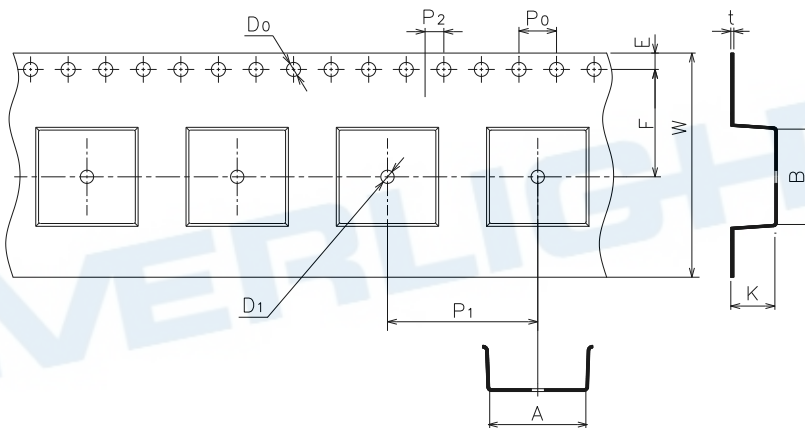
Notes

- | | |
|------|--|
| T | denotes Factory
No code : made in China
T : made in Taiwan |
| EL | denotes EVERLIGHT |
| 2631 | denotes Device Number |
| Y | denotes 1 digit Year code |
| WW | denotes 2 digit Week code |
| V | denotes VDE (optional) |

Tape & Reel Packing Specifications



Tape dimension

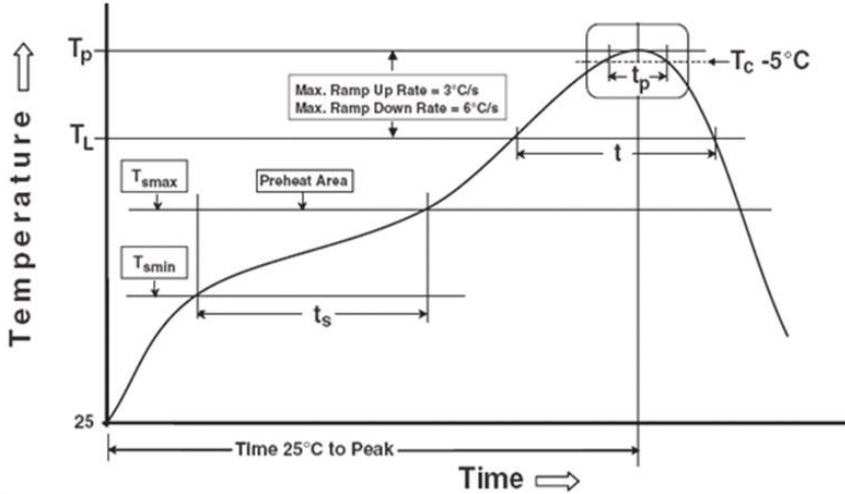


Dimension No.	A	B	Do	D1	E	F
Dimension(mm)	10.4±0.1	10.0±0.1	1.5+0.1/-0	1.5±0.25	1.75±0.1	7.5±0.1
Dimension No.	Po	P1	P2	t	W	K
Dimension(mm)	4.0±0.1	12.0±0.1	2.0±0.05	0.4±0.05	16.0±0.3	4.5±0.1

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

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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-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management