



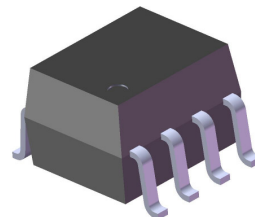
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8 PIN SOP HIGH SPEED 10MBit/s LOGIC GATE PHOTOCOUPLER

EL06XX series

Features:

- High speed 10Mbit/s
- Guaranteed performance from -40 to 85°C
- Wide operating temperature range of -40°C to 100°C
- Logic gate output
- High isolation voltage between input and output (Viso=3750 V rms)
- Pb free and RoHS compliant.
- cUL approved (No. E214129)
- VDE approved (No. 40028116)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved



Description

The EL0600 and EL0601 devices each consists of an infrared emitting diode optically coupled to a high speed integrated photo detector logic gate with a strobable output.

The devices are packaged in an 8-pin small outline package which conforms to the standard SO8 footprint.

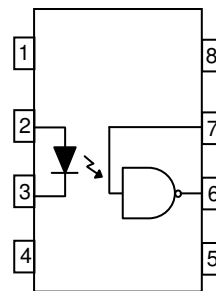
Applications

- 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

Truth Table (Positive Logic)

Input	Enable	Output
H	H	L
L	H	H
H	L	H
L	L	H
H	NC	L
L	NC	H

Schematic



A 0.1 μ F bypass capacitor must be connected between pins 8 and 5^{**3}

Pin Configuration

- 1, No Connection
- 2, Anode
- 3, Cathode
- 4, No Connection
- 5, Gnd
- 6, Vout
- 7, V_E
- 8, V_{CC}



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Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	20	mA
	Enable input voltage Not exceed V_{CC} by more than 500mV	V_E	5.5	V
	Reverse voltage	V_R	5	V
	Power dissipation	P_D	40	mW
Output	Power dissipation	P_C	85	mW
	Enable input current	I_E	5	mA
	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	100	mW
Isolation voltage ^{*1}		V_{ISO}	3750	V rms
Operating temperature		T_{OPR}	-40 ~ +100	$^\circ\text{C}$
Storage temperature		T_{STG}	-55 ~ +125	$^\circ\text{C}$
Soldering temperature ^{*2}		T_{SOL}	260	$^\circ\text{C}$

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.



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EL06XX series

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	$I_F = 10\text{mA}$
Reverse voltage	V_R	5.0	-	-	V	$I_R = 10\mu\text{A}$
Temperature coefficient of forward voltage	$\Delta V_F/\Delta T_A$	-	-1.8	-	mV/ $^\circ\text{C}$	$I_F = 10\text{mA}$
Input capacitance	C_{IN}	-	60	-	pF	$V_F = 0, f = 1\text{MHz}$

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
High level supply current	I_{CCH}	-	-	10	mA	$I_F = 10\text{mA}, V_E = 0.5\text{V}, V_{CC} = 5.5\text{V}$
Low level supply current	I_{CCL}	-	-	13	mA	$I_F = 0\text{mA}, V_E = 0.5\text{V}, V_{CC} = 5.5\text{V}$
High level enable current	I_{EH}	-	-	-1.6	mA	$V_E = 2.0\text{V}, V_{CC} = 5.5\text{V}$
Low level enable current	I_{EL}	-	-	-1.6	mA	$V_E = 0.5\text{V}, V_{CC} = 5.5\text{V}$
High level enable voltage	V_{EH}	2.0	-	-	V	$I_F = 10\text{mA}, V_{CC} = 5.5\text{V}$
Low level enable voltage	V_{EL}	-	-	0.8	V	$I_F = 10\text{mA}, V_{CC} = 5.5\text{V}$

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

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
HIGH Level Output Current	I_{OH}	-	-	100	μA	$V_{CC} = 5.5\text{V}, V_O = 5.5\text{V}, I_F = 250\mu\text{A}, V_E = 2.0\text{V}$
LOW Level Output Current	V_{OL}	-	-	0.6	V	$V_{CC} = 5.5\text{V}, I_F = 5\text{mA}, V_E = 2.0\text{V}, I_{CL} = 13\text{mA}$
Input Threshold Current	I_{FT}	-	-	5	mA	$V_{CC} = 5.5\text{V}, V_O = 0.6\text{V}, V_E = 2.0\text{V}, I_{OL} = 13\text{mA}$



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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	T _{PHL}	-	35	75	ns	C _L = 15pF, R _L =350Ω, T _A =25°C
Propagation delay time to output Low level	T _{PLH}	-	45	75	ns	C _L = 15pF, R _L =350Ω, T _A =25°C
Pulse width distortion	T _{pHl} – T _{plh}	-	10	35	ns	C _L = 15pF, R _L =350Ω
Output rise time	t _r	-	30	40	ns	C _L = 15pF, R _L =350Ω
Output fall time	t _f	-	10	20	ns	C _L = 15pF, R _L =350Ω

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

Enable Propagation Delay Time to Output High Level		t _{ELH}	-	30	40	ns	I _F = 7.5mA, V _{EH} =3.5V, C _L = 15pF, R _L =350Ω
Enable Propagation Delay Time to Output Low Level		t _{EHL}	-	20	30	ns	I _F = 7.5mA, V _{EH} =3.5V, C _L = 15pF, R _L =350Ω
Common Mode Transient Immunity at Logic High	EL0600	ICM _{HL}	-	-	-	V/μs	I _F = 0mA, V _{OH(MIN)} =2.0V, R _L =350Ω, T _A =25°C V _{CM} =10V
	EL0601		5,000	-	-		I _F = 0mA, V _{OH(MIN)} =2.0V, R _L =350Ω, T _A =25°C V _{CM} =50V
Common Mode Transient Immunity at Logic Low	EL0600	ICM _{HL}	-	-	-	V/μs	I _F = 7.5mA, V _{OL(MAX)} =0.8V, R _L =350Ω, T _A =25°C V _{CM} =10V
	EL0601		5,000	-	-		I _F = 7.5mA, V _{OL(MAX)} =0.8V, R _L =350Ω, T _A =25°C V _{CM} =50V

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Typical Performance Curves

Figure 1. Forward Current vs Forward Voltage

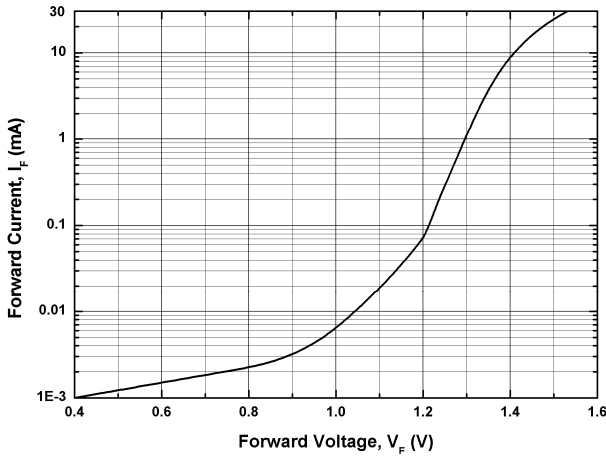


Figure 2. Low Level Output Voltage vs Ambient Temperature

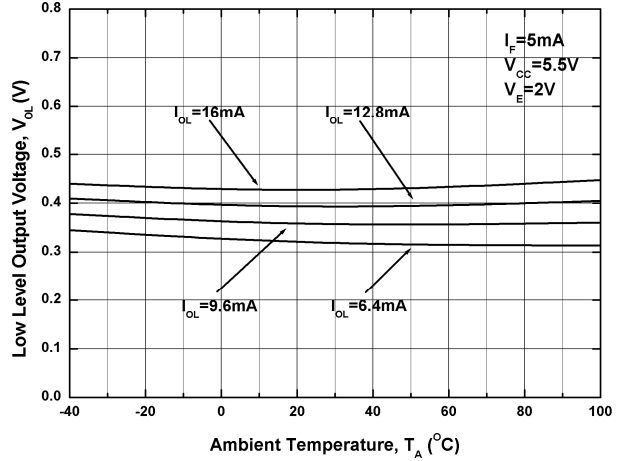


Figure 3. Low Level Output Current vs Ambient Temperature

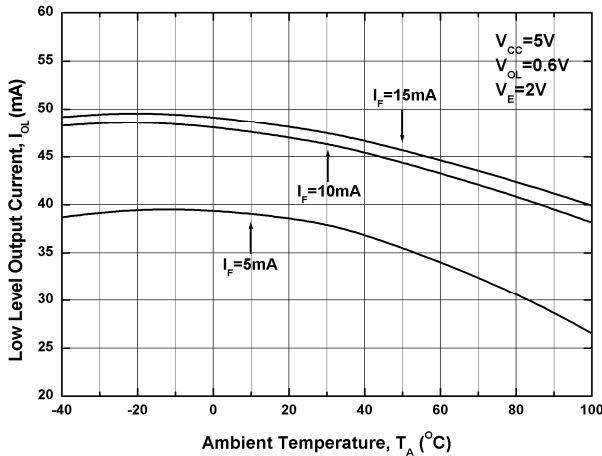


Figure 4. Input Threshold Current vs Ambient Temperature

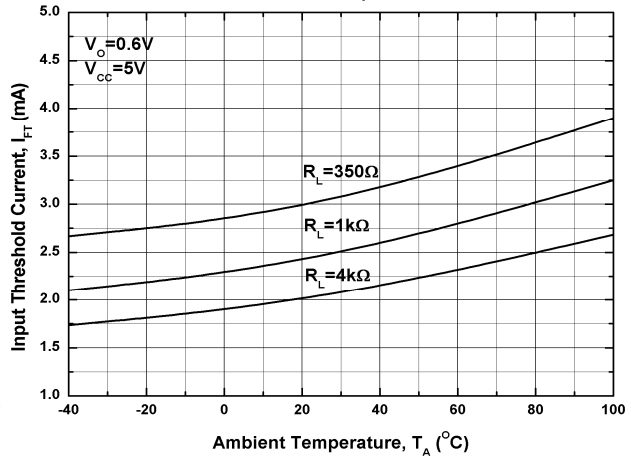


Figure 5. Input Current vs Output Voltage

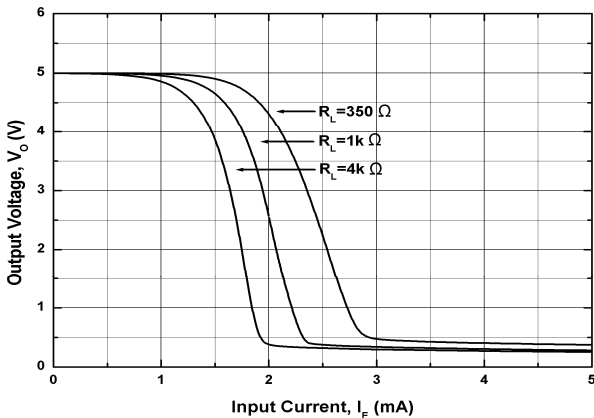
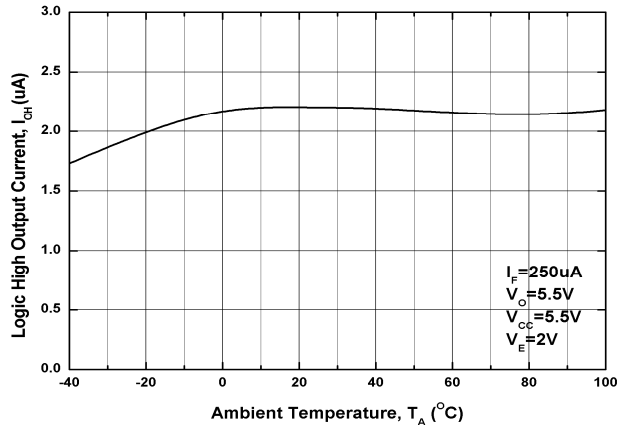


Figure 6. High Level Output Current vs Ambient Temperature



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Figure 7. Propagation Delay vs. Forward Current

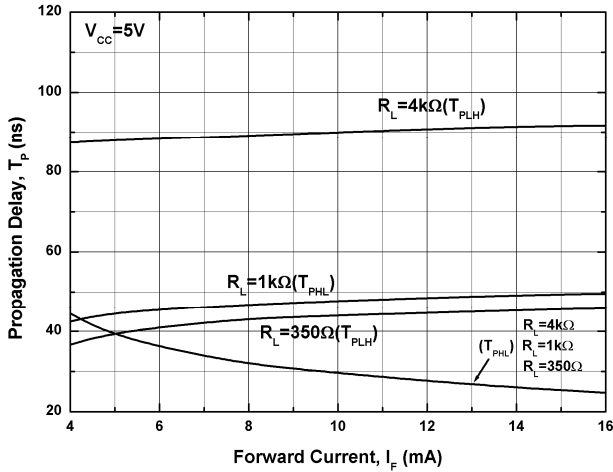


Figure 8. Propagation Delay vs. Temperature

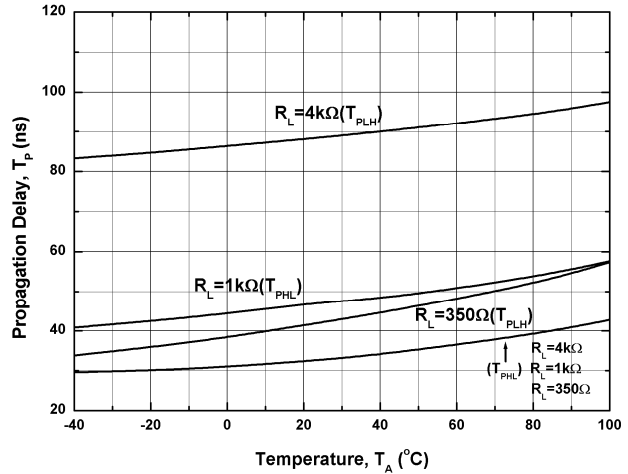


Figure 9. Pulse Width Distortion vs. Temperature

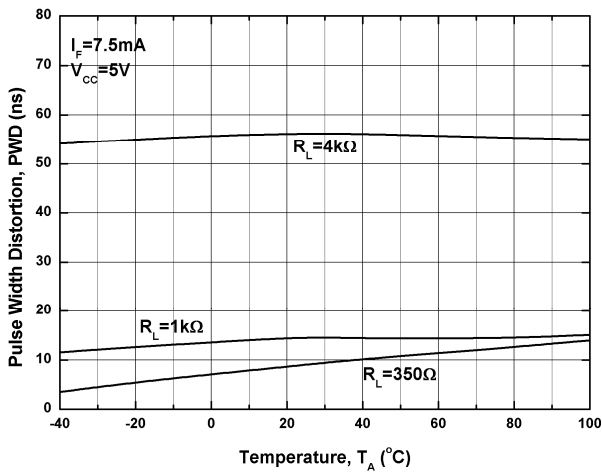


Figure 10. Rise and Fall Time vs. Temperature

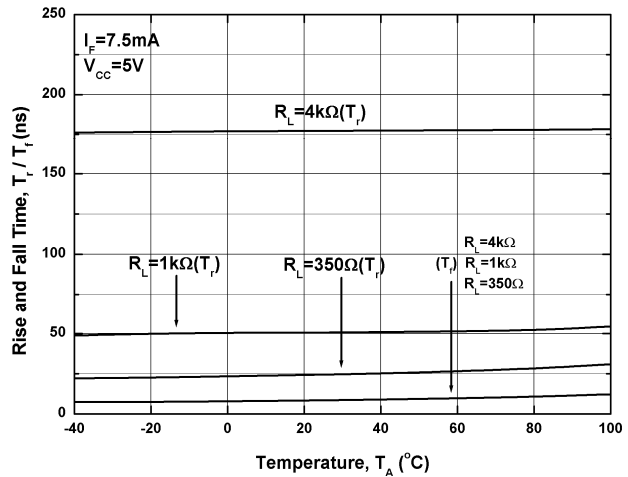
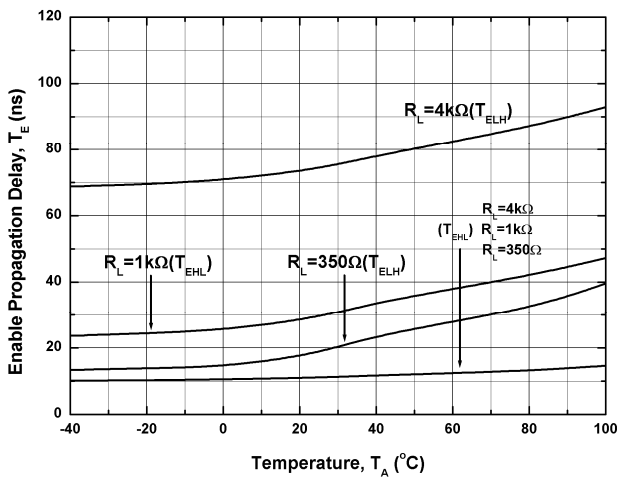


Figure 11. Enable Propagation Delay vs. Temperature



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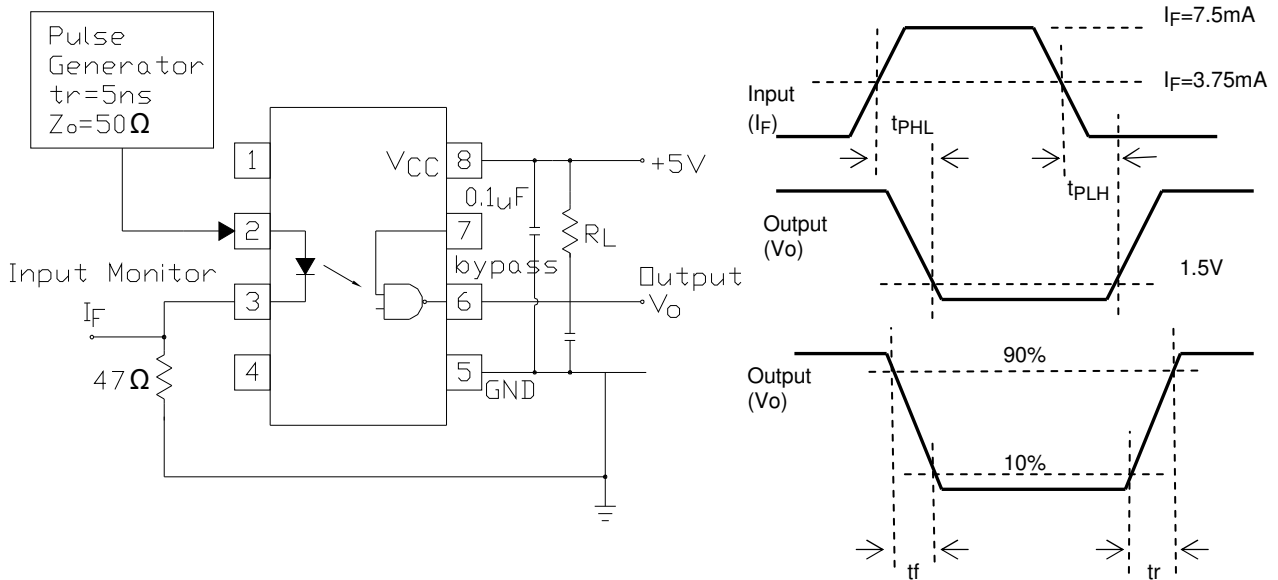


Fig. 12 Test circuit and waveforms for t_{PHL} , t_{PLH} , t_r , and t_f

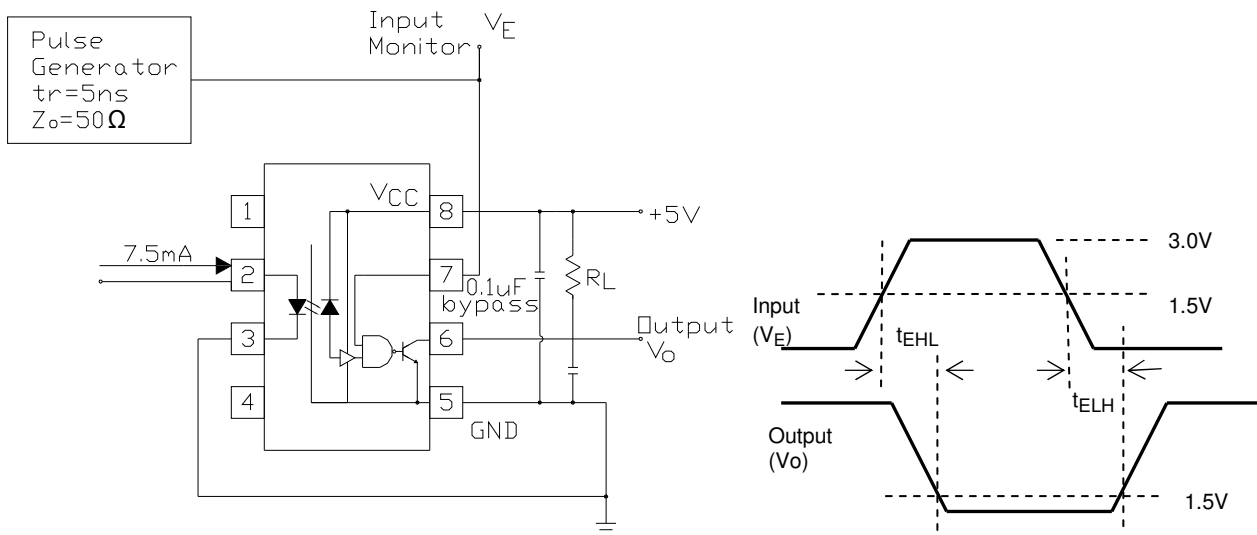


Fig. 13 Test circuit and waveform for t_{EHL} and t_{ELH}

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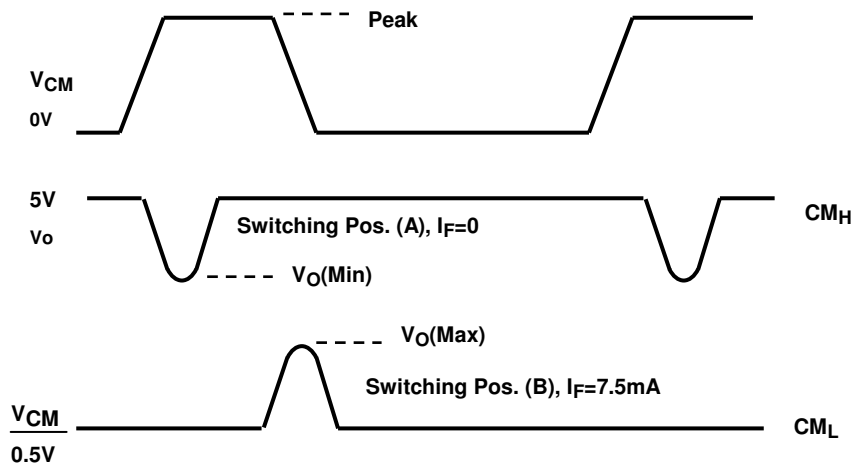
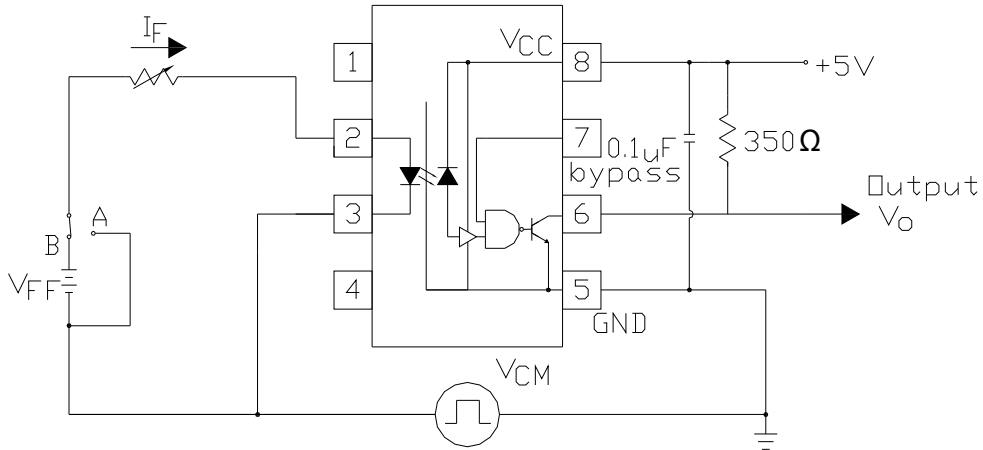


Fig. 14 Test circuit Common mode Transient Immunity

Notes:

- *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 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).
- *5 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).



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Order Information

Part Number

EL06XX(Z)-V

Note

- X = Part no. (X = 00 or 01)
- Z = Tape and reel option (TA, TB or none).
- V = VDE (optional)

Option	Description	Packing quantity
None	Standard	100 units per tube
-V	Standard + VDE	100 units per tube
(TA)	TA tape & reel option	2000 units per reel
(TB)	TB tape & reel option	2000 units per reel
(TA)-V	TA tape & reel option + VDE	2000 units per reel
(TB)-V	TB tape & reel option + VDE	2000 units per reel



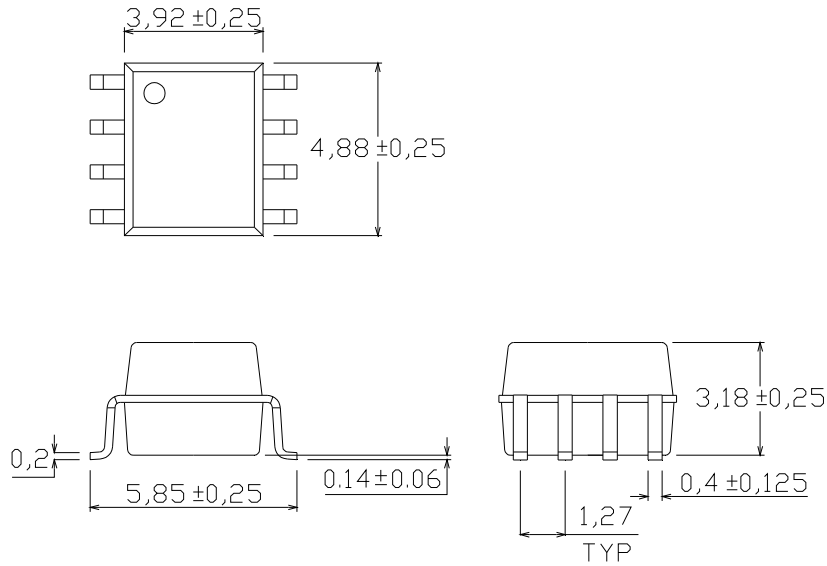
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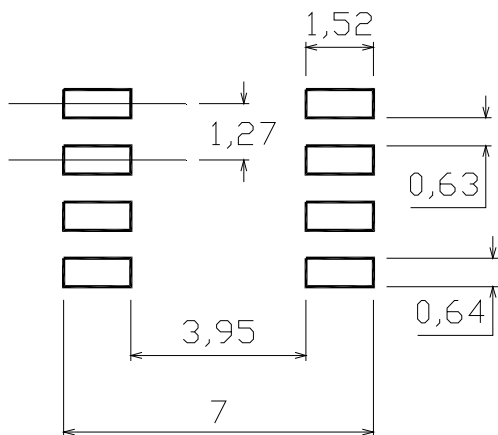
EL06XX series

Package Drawing

(Dimensions in mm)



Recommended pad layout for surface mount leadform



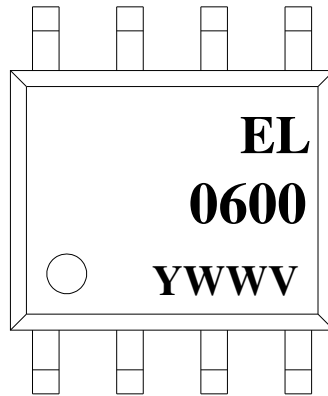


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Device Marking



Notes

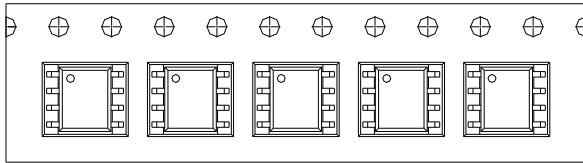
0600 denotes Device Number
Y denotes 1 digit Year code
WW denotes 2 digit Week code
V denotes VDE (optional)

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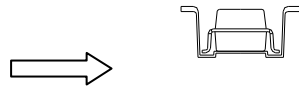
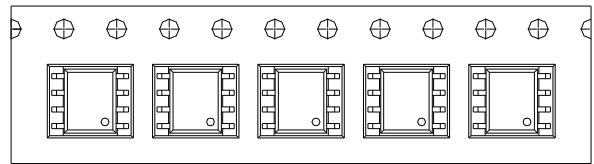
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Tape & Reel Packing Specifications

Option TA



Option TB

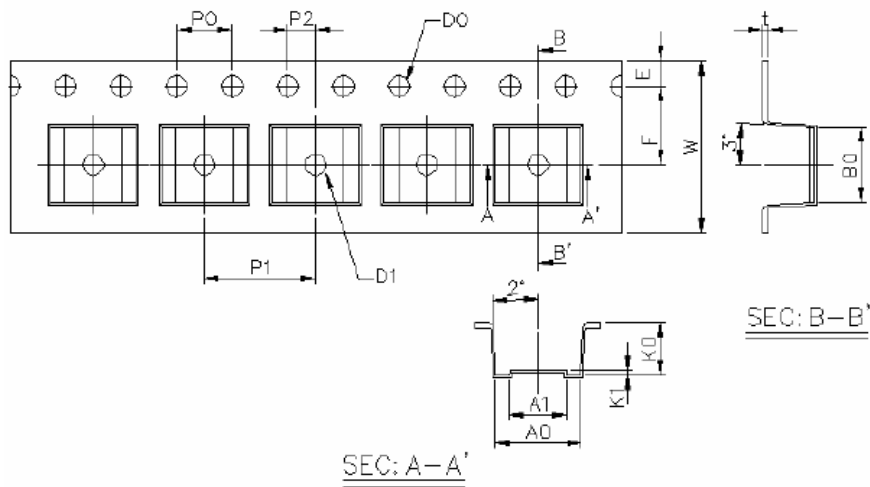


Direction of feed from reel



Direction of feed from reel

Tape dimensions



Dimension No.	A0	A1	B0	D0	D1	E	F
Dimension(mm)	6.2±0.1	4.1±0.1	5.28±0.1	1.5±0.1	1.5±0.3	1.75±0.1	5.5±0.1
Dimension No.	Po	P1	P2	t	W	K0	K1
Dimension(mm)	4.0±0.1	8.0±0.1	2.0±0.1	0.4±0.1	12.0+0.3/ -0.1	3.7±0.1	0.3±0.1

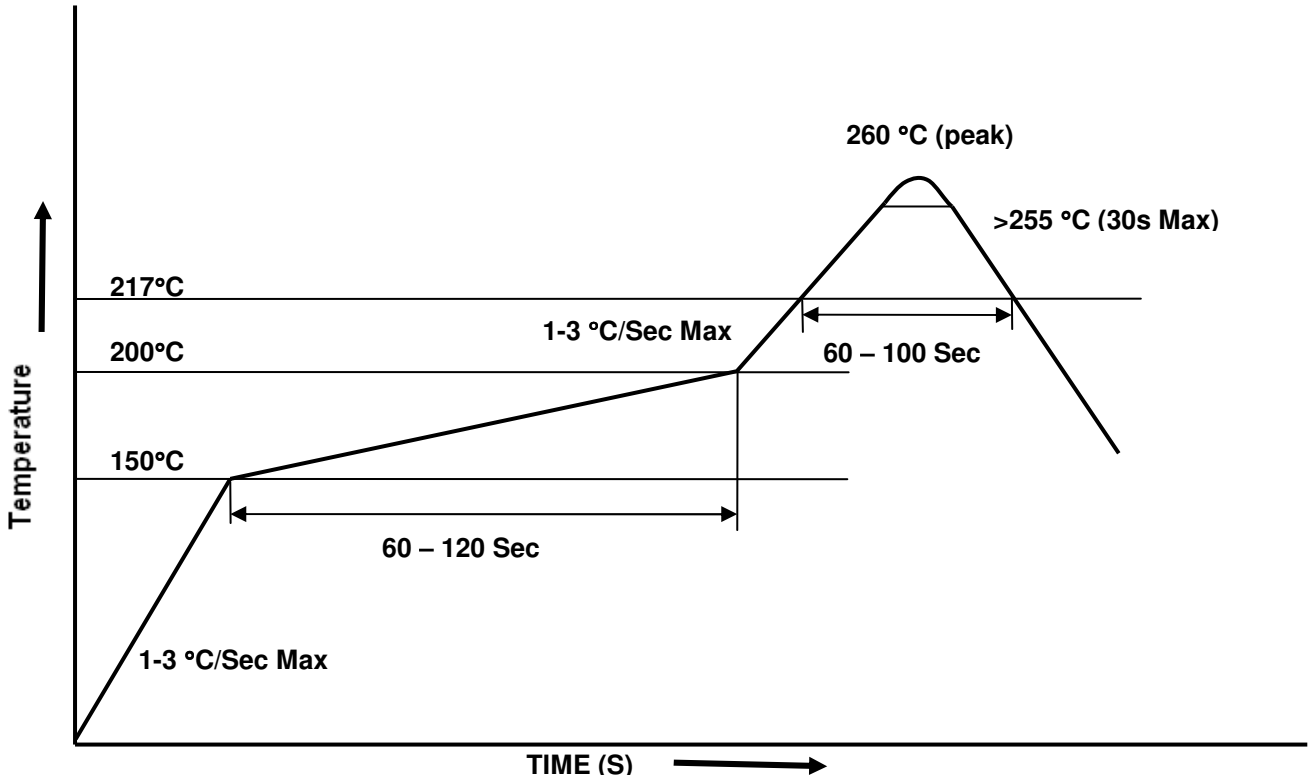


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Solder Reflow Temperature Profile





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