



ORIENT

Photo coupler

Product Data Sheet

MPN: OR-H61L

Customer:

Date:

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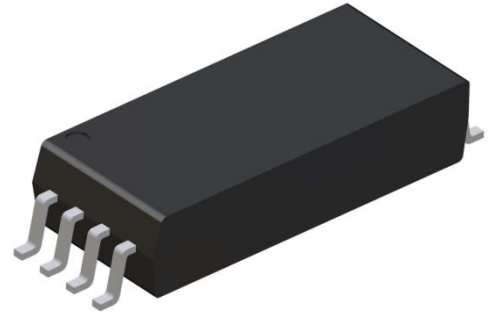
www.orient-opto.com

Preliminary

This datasheet is a preliminary design specification, and the formal specifications are subject to the recognition letter with jointly signed

1. Features

- (1) High-speed 10MBd
- (2) Operating temperature range of -40°C to 105°C.
- (3) Wide supply voltage: 2.7V to 5.5V
- (4) CMOS output
- (5) Package: 15-mm stretched SO8L.
- (6) Creepage distance > 15mm
- (7) High isolation voltage between input and output ($V_{iso} = 7500 \text{ V rms}$).
- (8) Maximum Working Insulation Voltage ($V_{iorm} = 2262 \text{ V peak}$)
- (9) Safety approval
CQC approved (No. CQC26001500901)
- (10) In compliance with RoHS, REACH standards
- (11) MSL Level 1
- (12) CTI ≥ 600



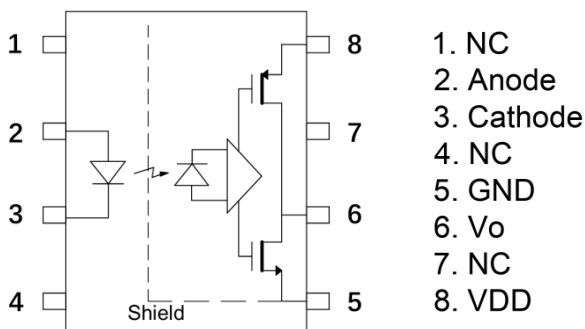
2. Instructions

The OR-H61L are optical coupled isolators containing a GaAlAs LED on the input side and a high-speed CMOS output IC on the output side on one chip. They are packaged in SOP8L.

3. Application Range

- (1) Microprocessor system interfaces
- (2) Communication interfaces: RS485, CANBus, USB
- (3) High speed A/D and D/A conversion
- (4) PLC, ATE input/output isolation
- (5) High Voltage Isolation

4. Functional Diagram



5. Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rated Value	Unit
Input	Forward Current	I _F	20	mA
	Reverse Voltage	V _R	5	V
	Input Power Dissipation	P _{IN}	20	mW
Output	Supply Voltage	V _{DD}	6.5	V
	Output Voltage	V _O	-0.5~V _{DD} +0.5	V
	Output Current	I _O	10	mA
	Power Dissipation	P _O	30	mW
*1 Insulation Voltage		V _{iso}	7500	V _{rms}
Maximum transient isolation voltage (Insulating oil test)		V _{IOTM}	12000	V _{peak}
Maximum repetitive peak isolation voltage		V _{IORM}	2262	V _{peak}
Operating Temperature		T _{opr}	-40 to 105	°C
Storage Temperature		T _{stg}	-55 to 125	
*2 Soldering Temperature		T _{sol}	260	

*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. soldering time is 10 seconds.

6. Insulation and Safety Related Specifications

Characteristics	Symbol	Min	Typ.	Max	Unit
Supply voltage	V _{DD}	2.7	---	5.5	V
Input Current, Low Level	I _{FL}	0	---	0.25	mA
Input Current, High Level	I _{FH}	5	---	8.0	mA
Operating temperature	T _{OPR}	-40	---	105	°C

Note:

Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

7. Insulation and Safety Related Specifications

Parameter	Symbol	Value	Unit	Conditions
Minimum External Air Gap (External Clearance)	L	15	mm	Measured from input terminals to output terminals, shortest distance through air
Minimum External Tracking (External Creepage)	L	15	mm	Measured from input terminals to output terminals, shortest distance path along body.
Minimum Internal Plastic Gap (Internal Clearance)		0.5	mm	Through insulation distance conductor to conductor, usually the straight line distance thickness between the emitter and detector.
Comparative Tracking Index	CTI	≥600	V	The corresponding voltage number for applying 50 drops of electrolyte

8. Opto-electronic Characteristics

Parameter		Symbol	MIN.	TYP.	MAX.	Unit	Conditions
INPUT	Forward Voltage	V_F	---	1.3	1.8	V	$I_F = 7\text{mA}$
	Reverse Current	I_R	---	---	10	μA	$V_R = 5\text{V}$
	Forward Voltage Temperature Coefficient	$\Delta V_F / \Delta T_A$	---	-1.0	---	mV/C	$I_F = 12\text{mA}$
	Terminal Capacitance	C_t	---	20	---	pF	$V = 0\text{V}, f = 1\text{MHz}$
OUTPUT	Logic High Output Voltage	V_{OH}	VDD-0.1	---	---	V	$I_F = 0\text{mA}, I_O = -20\mu\text{A}$
			VDD-1.0	---	---		$I_F = 0\text{mA}, I_O = -3.2\text{mA}$
	Logic Low Output Voltage	V_{OL}	---	---	0.1	V	$I_F = 7\text{mA}, V_{CC} = 5\text{V}/3.3\text{V}, I_O = 20\mu\text{A}$
			---	---	0.4		$I_F = 7\text{mA}, V_{CC} = 5\text{V}/3.3\text{V}, I_O = 3\text{mA}$
	Input Threshold Current	I_{TH}	---	2.2	3.8	mA	$V_O < 0.8\text{V}$
	High Level Supply Current	I_{DDH}	---	6	12	mA	$I_F = 0\text{mA}, V_{DD} = 5\text{V}$
	Low Level Supply Current	I_{DDL}	---	5.1	10	mA	$I_F = 7\text{mA}, V_{DD} = 5\text{V}$
	Input-Output Isolation Resistance	R_{I-O}	10^{11}	---	---	Ω	$V_{I-O} = 1\text{kVDC}$
	Input-Output Isolation Capacitance	C_{I-O}	---	0.2	---	pF	$V = 0\text{V}, f = 1\text{MHz}$

* Over recommended temperature ($T_A = -40^\circ\text{C}$ to 105°C), supply voltage ($2.7\text{V} \leq V_{DD} \leq 5.5\text{V}$). All typical specifications are at $V_{DD} = 5.0\text{V}$, $T_A = 25^\circ\text{C}$, unless otherwise specified.

9. Switching Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Propagation Delay Time to Low Output Level	t_{PHL}	---	---	100	ns	$I_F = 7 \text{ mA}$ $V_{CC} = 5.0 \text{ V}/3.3 \text{ V}$ $C_L = 15 \text{ pF}$
Propagation Delay Time to High Output Level	t_{PLH}	---	---	100	ns	

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



10. Order Information

Part Number

OR-H61LY-Z

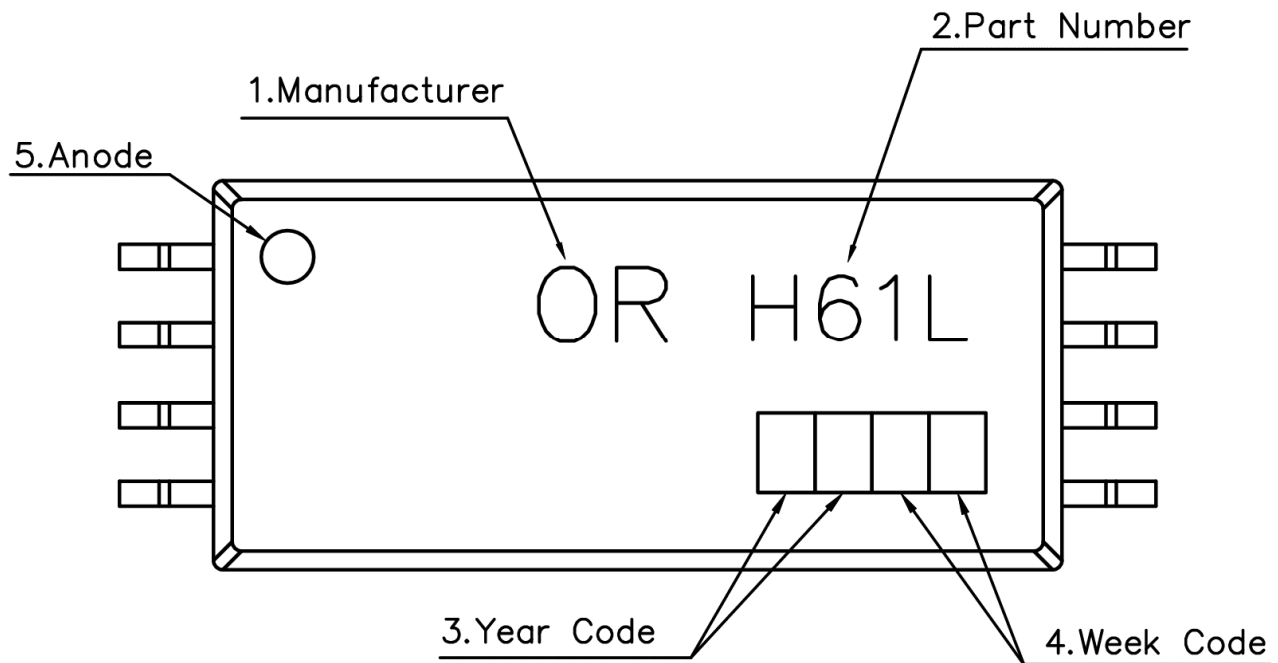
Note

H61L = Part Number.

Y = Lead form option (W1)

Z = Tape and reel option (TP,TP1 or none).

11. Naming Rule



1. Manufacturer : ORIENT.

2. Part Number :H61L.

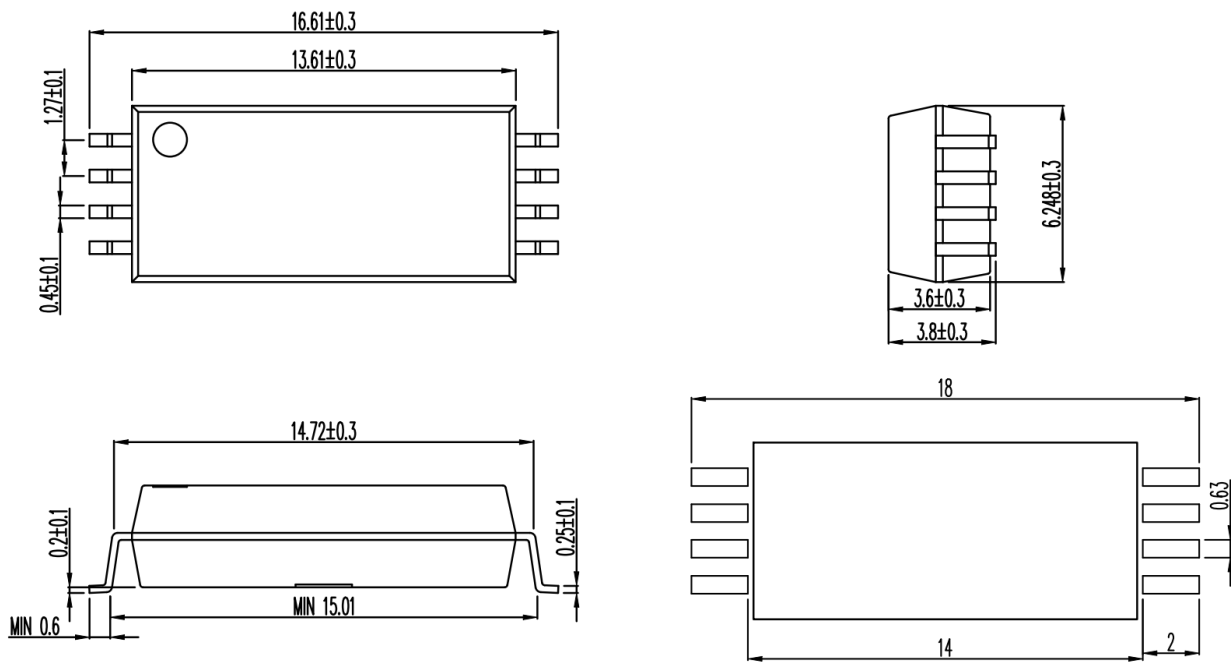
3. Year Code : '24' means '2024' and so on.

4. Week Code : 01 means the first week, 02 means the second week and so on.

5. Anode.

12. Package Dimension(Dimensions in mm)

(1) OR-H61LW1

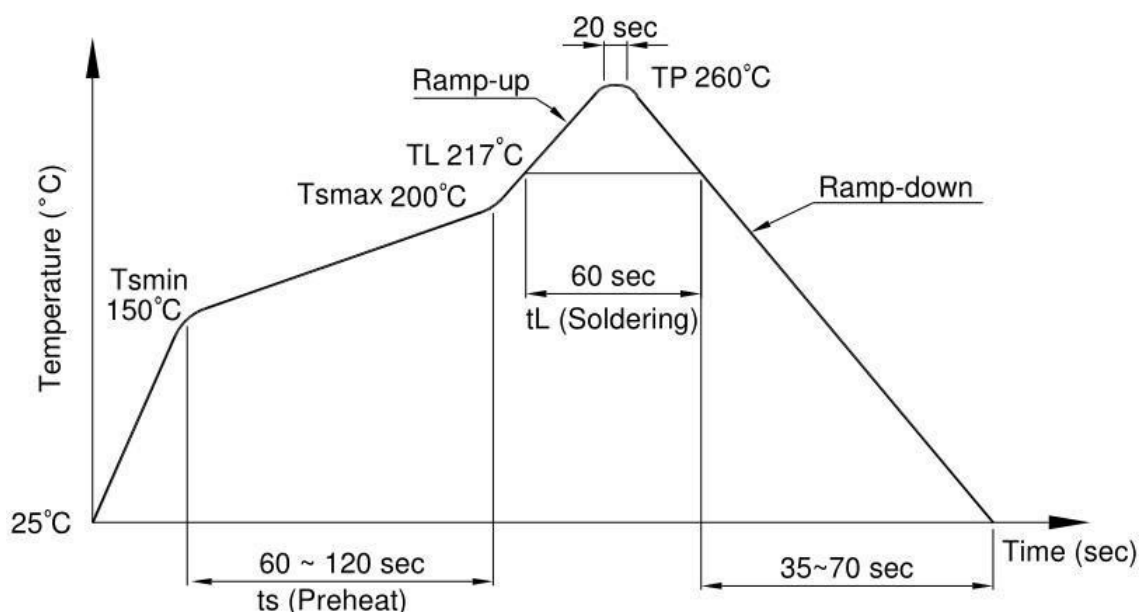


13. Temperature Profile Of Soldering

1. IR Reflow soldering (JEDEC-STD-020 compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

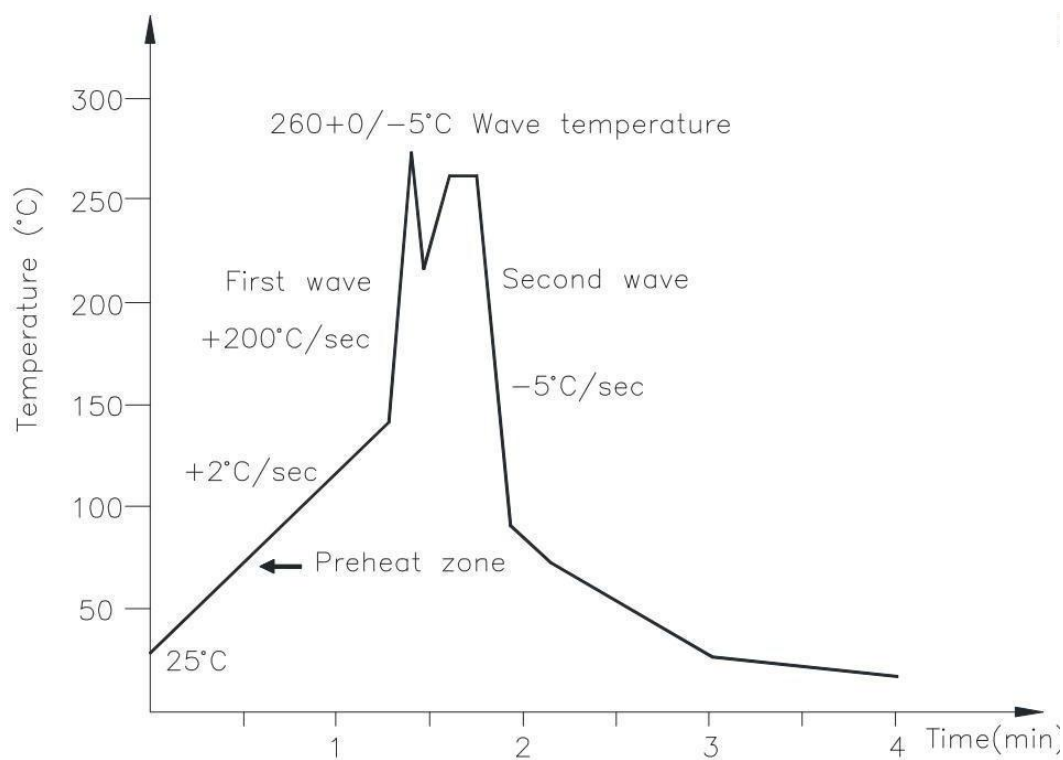
Profile item	Conditions
Preheat	
- Temperature Min (T Smin)	150°C
- Temperature Max (T Smax)	200°C
- Time (min to max) (ts)	90±30 sec
Soldering zone	
- Temperature (TL)	217°C
- Time (t L)	60 sec
Peak Temperature	260°C
Peak Temperature time	20 sec
Ramp-up rate	3°C / sec max.
Ramp-down rate from peak temperature	3~6°C / sec
Reflow times	≤3



2. Wave soldering (JEDEC22 A111 compliant)

One time soldering is recommended within the condition of temperature.

Temperature	260+0/-5°C
Time	10 sec
Preheat temperature	5 to 140°C
Preheat time	30 to 80 sec



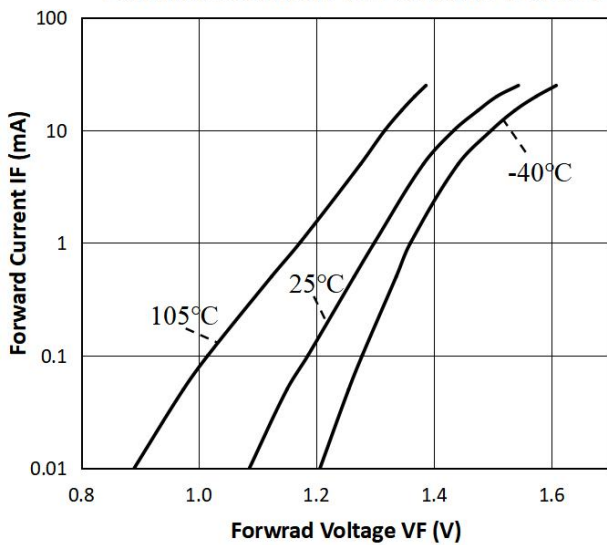
3. Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

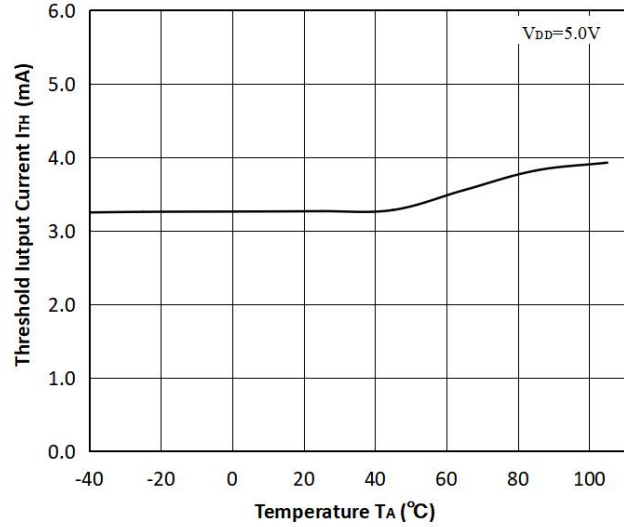
Temperature	380+0/-5°C
Time	3 sec max

14. Characteristics Curve

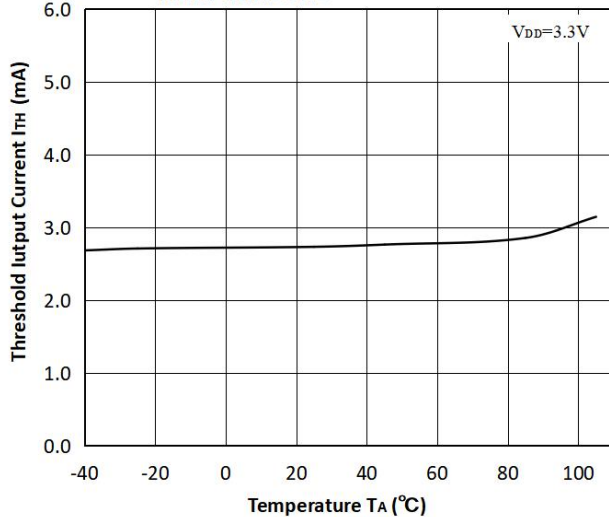
FORWARD CURRENT vs. FORWARD VOLTAGE



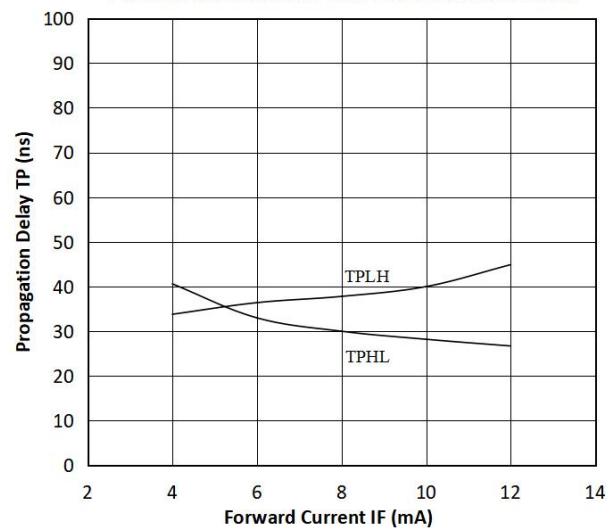
THRESHOLD IUTPUT CURRENT vs. TEMPERATURE



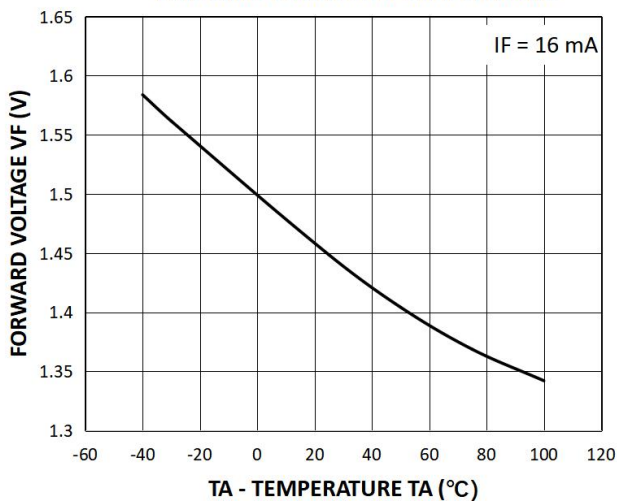
THRESHOLD IUTPUT CURRENT vs. TEMPERATURE



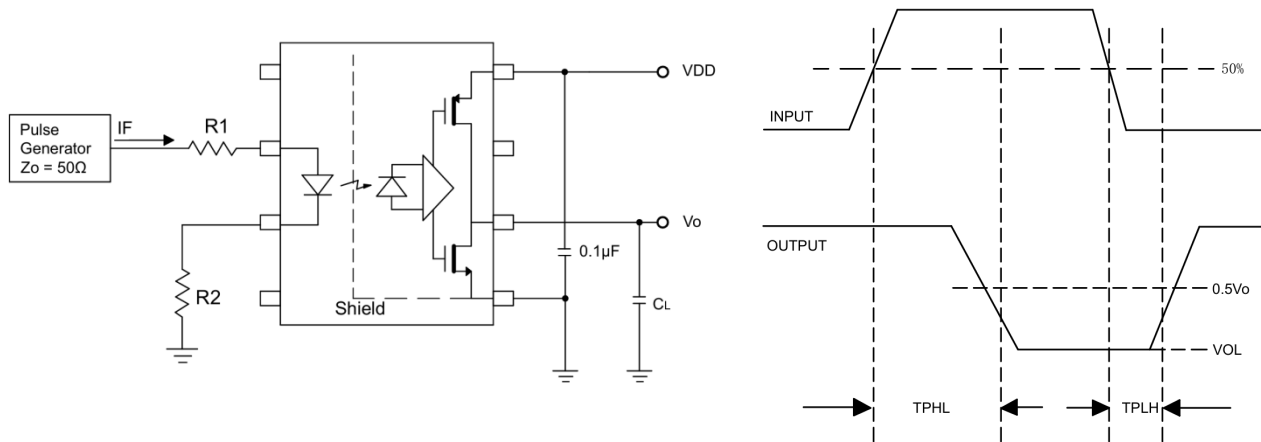
PROPAGATION DELAY TIME vs. Forward Current



FORWARD VOLTAGE VS. TEMPERATURE



15. Test Circuits



16. Notes

- (1) Orient is continually improving the quality, reliability, function or design and Orient reserves the right to make changes without further notices.
- (2) The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- (3) For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.
- (4) When requiring a device for any “specific” application, please contact our sales in advice.
- (5) If there are any questions about the contents of this publication, please contact us at your convenience.
- (6) The contents described herein are subject to change without prior notice.
- (7) Immerge unit’s body in solder paste is not recommended.