





| ABSOLUTE MAXIMUM RATINGS                 |                     |              |                  |           |
|--|---------------------|--------------|------------------|-----------|
| PARAMETER                                | TEST CONDITION      | SYMBOL       | VALUE            | UNIT      |
| <b>INPUT</b>                             |                     |              |                  |           |
| Average forward current                  |                     | $I_F$        | 20               | mA        |
| Reverse input voltage                    |                     | $V_R$        | 5                | V         |
| Enable input voltage                     |                     | $V_E$        | $V_{CC} + 0.5 V$ | V         |
| Enable input current                     |                     | $I_E$        | 5                | mA        |
| Surge current                            | $t = 100 \mu s$     | $I_{FSM}$    | 200              | mA        |
| Input junction temperature               |                     | $T_{J max.}$ | 125              | °C        |
| Output power dissipation                 |                     | $P_{diss}$   | 35               | mW        |
| <b>OUTPUT</b>                            |                     |              |                  |           |
| Supply voltage                           | 1 min maximum       | $V_{CC}$     | 7                | V         |
| Output current                           |                     | $I_O$        | 50               | mA        |
| Output voltage                           |                     | $V_O$        | 7                | V         |
| Output junction temperature              |                     | $T_{J max.}$ | 125              | °C        |
| Output power dissipation                 |                     | $P_{diss}$   | 85               | mW        |
| <b>COUPLER</b>                           |                     |              |                  |           |
| Isolation voltage                        | $t = 1 \text{ min}$ | $V_{ISO}$    | 5300             | $V_{RMS}$ |
| Storage temperature                      |                     | $T_{stg}$    | -55 to +150      | °C        |
| Operating temperature                    |                     | $T_{amb}$    | -40 to +100      | °C        |
| Lead solder temperature                  | for 10 s            |              | 260              | °C        |
| Solder reflow temperature <sup>(1)</sup> |                     |              | 260              | °C        |

**Notes**

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.
- <sup>(1)</sup> Refer to reflow profile for soldering conditions for surface mounted devices (SMDW). Refer to wave profile for soldering conditions for through hole devices (DIPW).

| RECOMMENDED OPERATING CONDITIONS |                           |           |      |          |          |
|----------------------------------|---------------------------|-----------|------|----------|----------|
| PARAMETER                        | TEST CONDITION            | SYMBOL    | MIN. | MAX.     | UNIT     |
| Operating temperature            |                           | $T_{amb}$ | -40  | 100      | °C       |
| Supply voltage                   |                           | $V_{CC}$  | 4.5  | 5.5      | V        |
| Input current low level          |                           | $I_{FL}$  | 0    | 250      | $\mu A$  |
| Input current high level         |                           | $I_{FH}$  | 5    | 15       | mA       |
| Logic high enable voltage        |                           | $V_{EH}$  | 2    | $V_{CC}$ | V        |
| Logic low enable voltage         |                           | $V_{EL}$  | 0    | 0.8      | V        |
| Output pull up resistor          |                           | $R_L$     | 330  | 4K       | $\Omega$ |
| Fanout                           | $R_L = 1 \text{ k}\Omega$ | N         |      | 5        | -        |

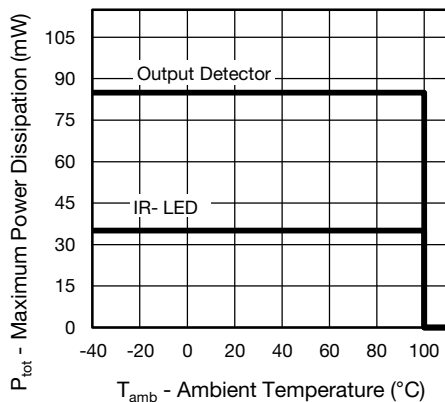


Fig. 1 - Dissipated Power vs. Ambient Temperature



| ELECTRICAL CHARACTERISTICS |  |           |      |      |      |               |
|----------------------------|--|-----------|------|------|------|---------------|
| PARAMETER                  | TEST CONDITION   | SYMBOL    | MIN. | TYP. | MAX. | UNIT          |
| <b>INPUT</b>               |  |           |      |      |      |               |
| Input forward voltage      | $I_F = 10 \text{ mA}$  | $V_F$     | 1.1  | 1.4  | 1.7  | V             |
| Reverse current            | $V_R = 5 \text{ V}$  | $I_R$     | -    | 0.01 | 10   | $\mu\text{A}$ |
| Input capacitance          | $f = 1 \text{ MHz}, V_F = 0 \text{ V}$   | $C_I$     | -    | 38   | -    | pF            |
| <b>OUTPUT</b>              |  |           |      |      |      |               |
| High level supply current  | $V_E = 0.5 \text{ V}, I_F = 0 \text{ mA}$  | $I_{CCH}$ | -    | 4.3  | 10   | mA            |
|                            | $V_E = V_{CC}, I_F = 0 \text{ mA}$   | $I_{CCH}$ | -    | 3.3  | -    | mA            |
| Low level supply current   | $V_E = 0.5 \text{ V}, I_F = 10 \text{ mA}$   | $I_{CCL}$ | -    | 4.3  | 13   | mA            |
|                            | $V_E = V_{CC}, I_F = 10 \text{ mA}$  | $I_{CCL}$ | -    | 3.3  | 6    | mA            |
| High level output current  | $V_E = 2 \text{ V}, V_O = 5.5 \text{ V}, I_F = 250 \mu\text{A}$                    | $I_{OH}$  | -    | 0.02 | 10   | $\mu\text{A}$ |
| Low level output voltage   | $V_E = 2 \text{ V}, I_F = 5 \text{ mA}, I_{OL} \text{ (sinking)} = 13 \text{ mA}$  | $V_{OL}$  | -    | 0.2  | 0.6  | V             |
| Input threshold current    | $V_E = 2 \text{ V}, V_O = 0.6 \text{ V}, I_{OL} \text{ (sinking)} = 13 \text{ mA}$ | $I_{TH}$  | -    | 2.4  | 5    | mA            |
| Input-output capacitance   | $f = 1 \text{ MHz}, T_{amb} = 25 \text{ }^\circ\text{C}$                           | $C_{IO}$  | -    | 0.9  | -    | pF            |
| High level enable current  | $V_E = 2 \text{ V}$  | $I_{EH}$  | -    | -0.6 | -1.6 | mA            |
| Low level enable current   | $V_E = 0.5 \text{ V}$  | $I_{EL}$  | -    | -0.8 | -1.6 | mA            |
| High level enable voltage  |  | $V_{EH}$  | 2    | -    | -    | V             |
| Low level enable voltage   |  | $V_{EL}$  | -    | -    | 0.8  | V             |

**Notes**

- Over recommended temperature ( $T_{amb} = -40 \text{ }^\circ\text{C}$  to  $+100 \text{ }^\circ\text{C}$ ),  $V_{CC} = 5 \text{ V}$ ,  $I_F = 7.5 \text{ mA}$  unless otherwise specified. All typicals at  $T_{amb} = 25 \text{ }^\circ\text{C}$ ,  $V_{CC} = 5 \text{ V}$ .
- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

| SWITCHING CHARACTERISTICS                                  |   |                       |      |      |      |      |
|--|---|-----------------------|------|------|------|------|
| PARAMETER  | TEST CONDITION  | SYMBOL                | MIN. | TYP. | MAX. | UNIT |
| Propagation delay time to high output level                | $R_L = 350 \Omega, C_L = 15 \text{ pF}$   | $t_{PLH}$             | 20   | 49   | 100  | ns   |
| Propagation delay time to low output level                 | $R_L = 350 \Omega, C_L = 15 \text{ pF}$   | $t_{PHL}$             | 25   | 46   | 100  | ns   |
| Pulse width distortion                                     | $R_L = 350 \Omega, C_L = 15 \text{ pF}$   | $ t_{PHL} - t_{PLH} $ | -    | 3.1  | 40   | ns   |
| Propagation delay skew                                     | $R_L = 350 \Omega, C_L = 15 \text{ pF}$   | $t_{PSK}$             | -    | 16   | 40   | ns   |
| Output rise time (10 % to 90 %)                            | $R_L = 350 \Omega, C_L = 15 \text{ pF}$   | $t_r$                 | -    | 14   | -    | ns   |
| Output fall time (90 % to 10 %)                            | $R_L = 350 \Omega, C_L = 15 \text{ pF}$   | $t_f$                 | -    | 7    | -    | ns   |
| Propagation delay time of enable from $V_{EH}$ to $V_{EL}$ | $R_L = 350 \Omega, C_L = 15 \text{ pF}, V_{EL} = 0 \text{ V}, V_{EH} = 3 \text{ V}$ | $t_{ELH}$             | -    | 11   | -    | ns   |
| Propagation delay time of enable from $V_{EL}$ to $V_{EH}$ | $R_L = 350 \Omega, C_L = 15 \text{ pF}, V_{EL} = 0 \text{ V}, V_{EH} = 3 \text{ V}$ | $t_{EHL}$             | -    | 9    | -    | ns   |

**Notes**

- Over recommended temperature ( $T_{amb} = -40 \text{ }^\circ\text{C}$  to  $+100 \text{ }^\circ\text{C}$ ),  $V_{CC} = 5 \text{ V}$ ,  $I_F = 7.5 \text{ mA}$  unless otherwise specified. All typicals at  $T_{amb} = 25 \text{ }^\circ\text{C}$ ,  $V_{CC} = 5 \text{ V}$ .
- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

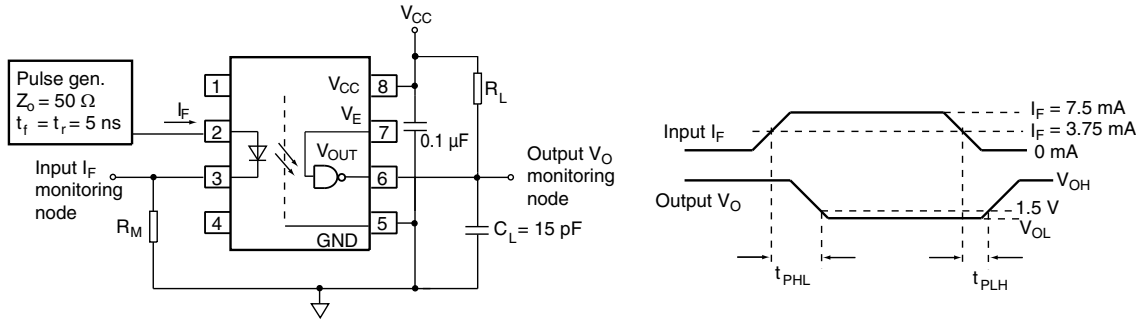


Fig. 2 - Test Circuit for  $t_{PLH}$ ,  $t_{PHL}$ ,  $t_r$  and  $t_f$

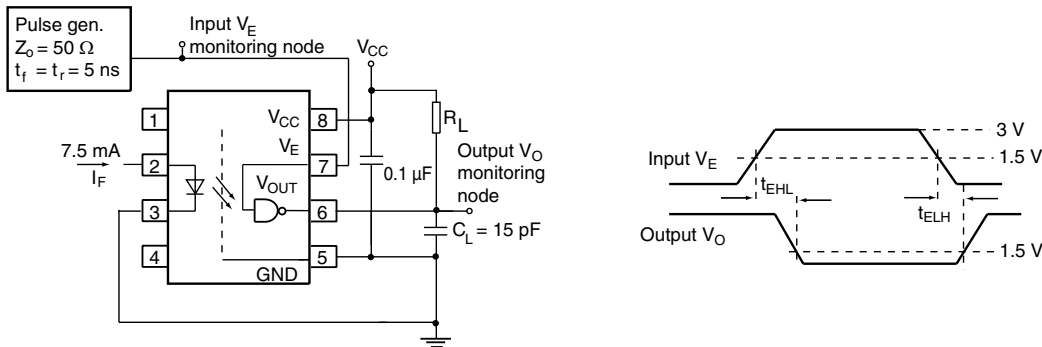


Fig. 3 - Test Circuit for  $t_{EHL}$  and  $t_{ELH}$

| COMMON MODE TRANSIENT IMMUNITY |   |         |          |        |        |      |                  |
|--------------------------------|---|---------|----------|--------|--------|------|------------------|
| PARAMETER                      | TEST CONDITION  | DEVICE  | SYMBOL   | MIN.   | TYP.   | MAX. | UNIT             |
| Common mode transient immunity | $ V_{CM}  = 1 \text{ kV}$ , $V_{CC} = 5 \text{ V}$ , $I_F = 0 \text{ mA}$ <sup>(1)(2)(3)(4)</sup>   | VOW137  | $ CM_H $ | 10 000 |        |      | V/ $\mu\text{s}$ |
|                                | $ V_{CM}  = 1 \text{ kV}$ , $V_{CC} = 5 \text{ V}$ , $I_F = 0 \text{ mA}$ <sup>(1)(2)(5)</sup>      | VOW2611 | $ CM_H $ | 25 000 | 40 000 |      | V/ $\mu\text{s}$ |
|                                | $ V_{CM}  = 1 \text{ kV}$ , $V_{CC} = 5 \text{ V}$ , $I_F = 7.5 \text{ mA}$ <sup>(1)(2)(3)(4)</sup> | VOW137  | $ CM_L $ | 10 000 |        |      | V/ $\mu\text{s}$ |
|                                | $ V_{CM}  = 1 \text{ kV}$ , $V_{CC} = 5 \text{ V}$ , $I_F = 7.5 \text{ mA}$ <sup>(1)(2)(5)</sup>    | VOW2611 | $ CM_L $ | 25 000 | 40 000 |      | V/ $\mu\text{s}$ |

**Notes**

- (2) Over recommended temperature ( $T_{amb} = -40 \text{ }^\circ\text{C}$  to  $+100 \text{ }^\circ\text{C}$ ),  $V_{CC} = 5 \text{ V}$ ,  $I_F = 7.5 \text{ mA}$  unless otherwise specified. All typicals at  $T_{amb} = 25 \text{ }^\circ\text{C}$ ,  $V_{CC} = 5 \text{ V}$ .
- (3) Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.
- (4) With pulling  $V_E$  to logic high state will improve the CMR performance.
- (5) VOW137 CMTI test circuit refer to Fig. 4
- (6) VOW2611 CMTI test circuit refer to Fig. 5

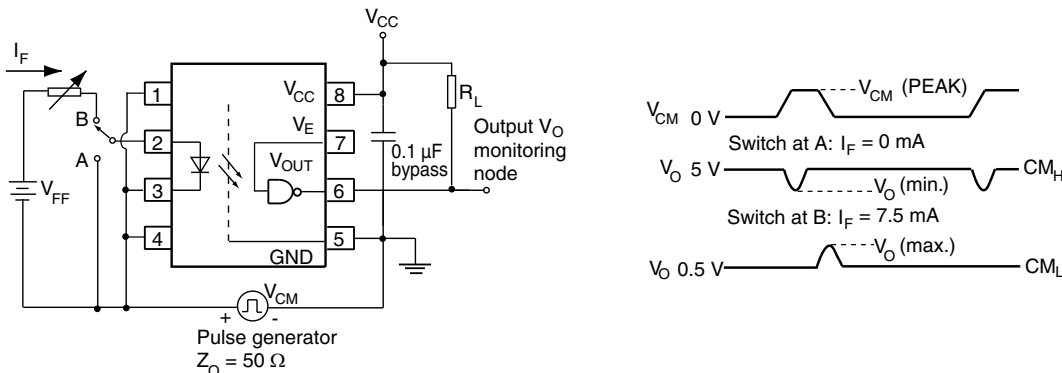


Fig. 4 - VOW137 Test Circuit for Common Mode Transient Immunity

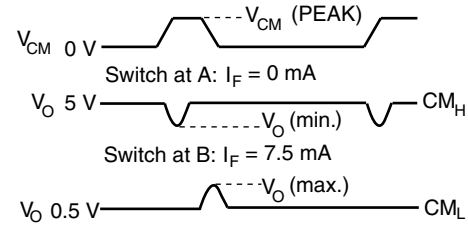
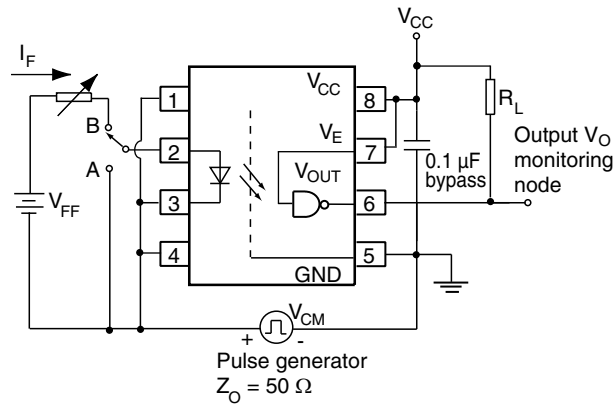


Fig. 5 - VOW2611 Test Circuit for Common Mode Transient Immunity

| SAFETY AND INSULATION RATINGS                                |  |            |                |            |
|--|--|------------|----------------|------------|
| PARAMETER  |  | SYMBOL     | VALUE          | UNIT       |
| <b>MAXIMUM SAFETY RATINGS</b>                                |  |            |                |            |
| Output safety power  |  | $P_{SO}$   | 700            | mW         |
| Input safety current   |  | $I_{si}$   | 350            | mA         |
| Safety temperature   |  | $T_S$      | 150            | °C         |
| Comparative tracking index                                   |  | CTI        | 250            |            |
| <b>INSULATION RATED PARAMETERS</b>                           |  |            |                |            |
| Maximum withstanding isolation voltage                       | $t = 1 \text{ min}$  | $V_{ISO}$  | 5300           | $V_{RMS}$  |
| Maximum transient isolation voltage                          |  | $V_{IOTM}$ | 8000           | $V_{peak}$ |
| Maximum repetitive peak isolation voltage                    |  | $V_{IORM}$ | 1414           | $V_{peak}$ |
| Insulation resistance  | $T_{amb} = 25 \text{ °C}, V_{DC} = 500 \text{ V}$  | $R_{IO}$   | $\geq 10^{12}$ | $\Omega$   |
| Isolation resistance   | $T_{amb} = 100 \text{ °C}, V_{DC} = 500 \text{ V}$   | $R_{IO}$   | $\geq 10^{11}$ | $\Omega$   |
| Input to output test voltage, method B                       | $V_{IORM} \times 1.875 = V_{PR}$ , 100 % production test with $t_M = 1 \text{ s}$ , partial discharge $< 5 \text{ pC}$ | $V_{PR}$   | 2651           | $V_{peak}$ |
| Input to output test voltage, method A                       | $V_{IORM} \times 1.6 = V_{PR}$ , 100 % production test with $t_M = 10 \text{ s}$ , partial discharge $< 5 \text{ pC}$  | $V_{PR}$   | 2262           | $V_{peak}$ |
| Climatic classification (according to IEC 68 part 1)         |  |            | 55/100/21      |            |
| Environment (pollution degree in accordance to DIN VDE 0109) |  |            | 2              |            |
| Clearance distance (DIP-8, widebody)                         |  |            | $\geq 10$      | mm         |
| Creepage distance (DIP-8, widebody)                          |  |            | $\geq 10$      | mm         |
| Insulation thickness   |  | DTI        | $\geq 0.4$     | mm         |

**Note**

- As per IEC 60747-5-5, §7.4.3.8.1, this optocoupler is suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

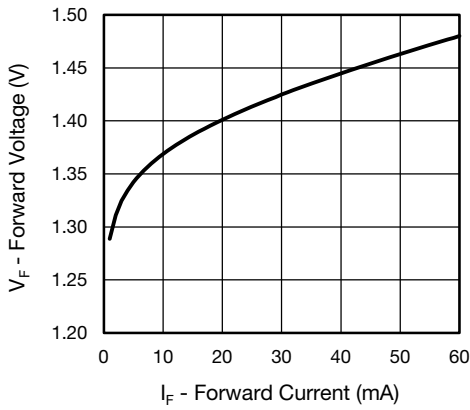


Fig. 6 - Forward Voltage vs. Forward Current

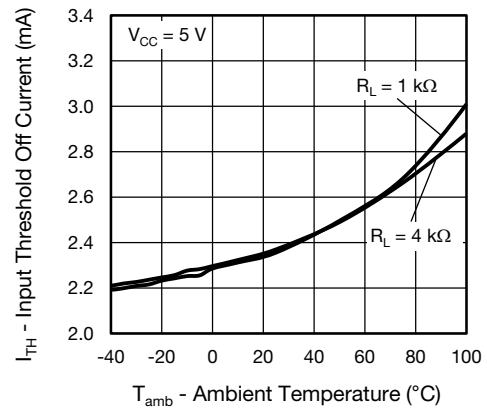


Fig. 9 - Input Threshold Off Current vs. Ambient Temperature

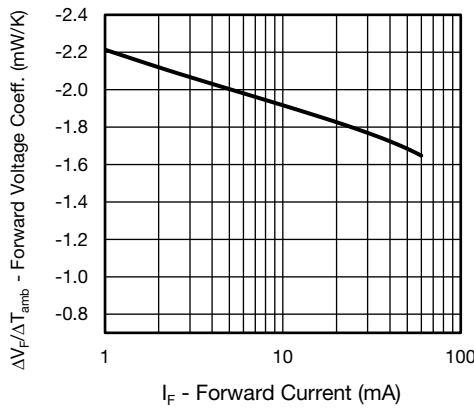


Fig. 7 - Forward Voltage Coefficient vs. Forward Current

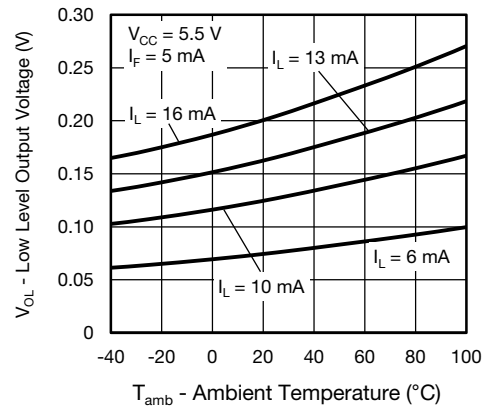


Fig. 10 - Low Level Output Voltage vs. Ambient Temperature

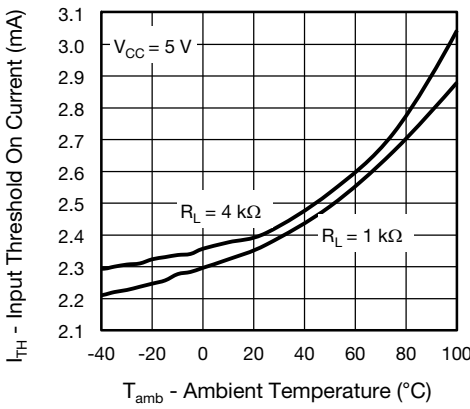


Fig. 8 - Input Threshold On Current vs. Ambient Temperature

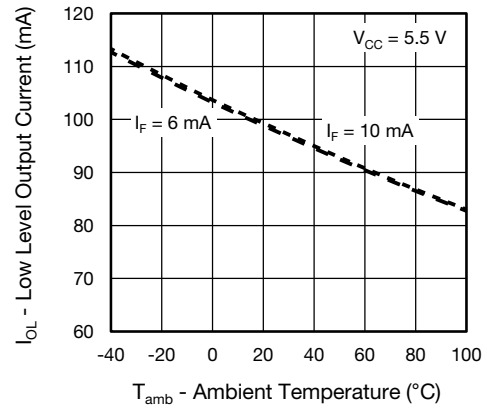


Fig. 11 - Low Level Output Current vs. Ambient Temperature

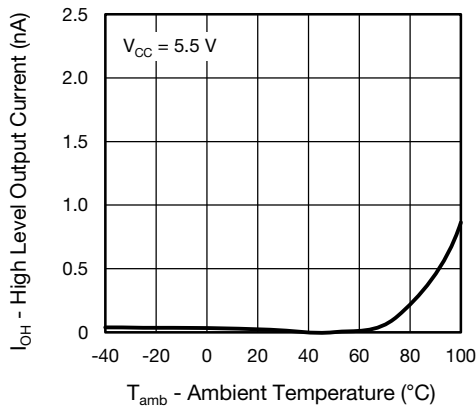


Fig. 12 - High Level Output Current vs. Ambient Temperature

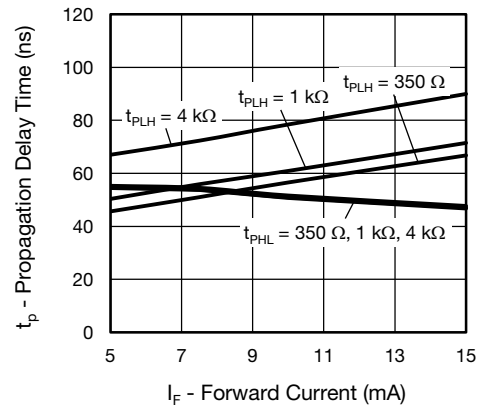


Fig. 15 - Propagation Delay vs. Forward Current

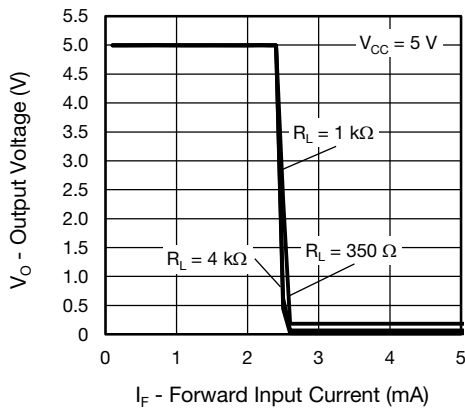


Fig. 13 - Output Voltage vs. Forward Current

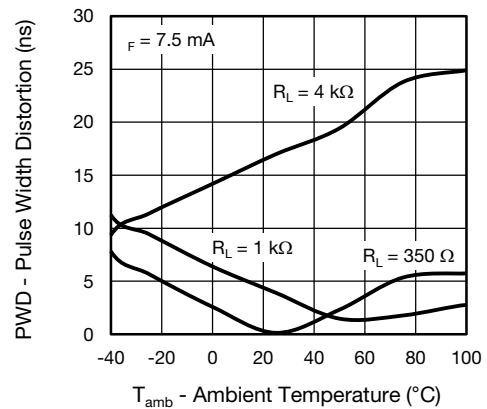


Fig. 16 - Pulse Width Distortion vs. Ambient Temperature

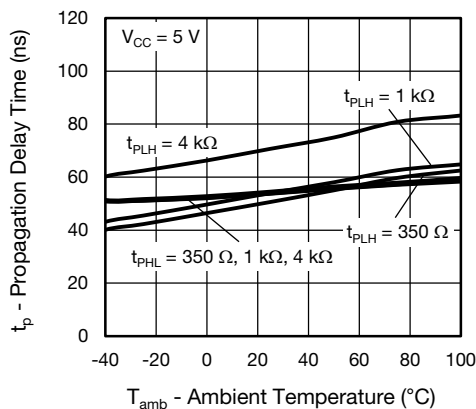


Fig. 14 - Propagation Delay vs. Ambient Temperature

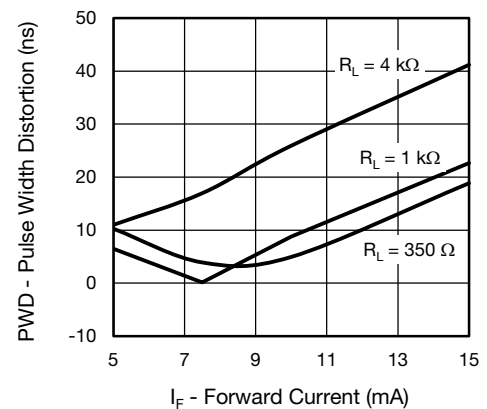


Fig. 17 - Pulse Width Distortion vs. Forward Current

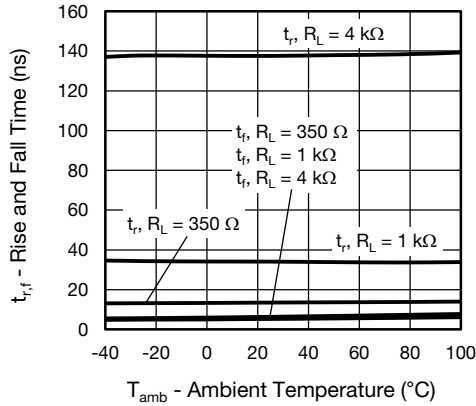


Fig. 18 - Rise and Fall Time vs. Ambient Temperature

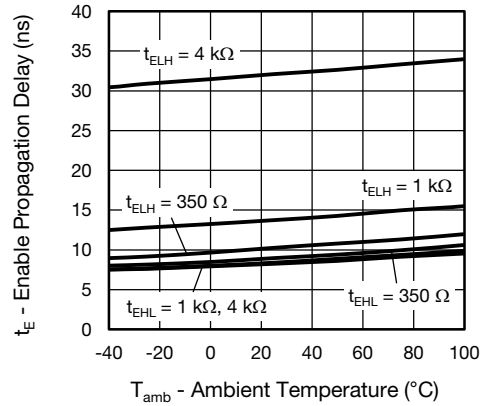


Fig. 20 - Enable Propagation Delay vs. Ambient Temperature

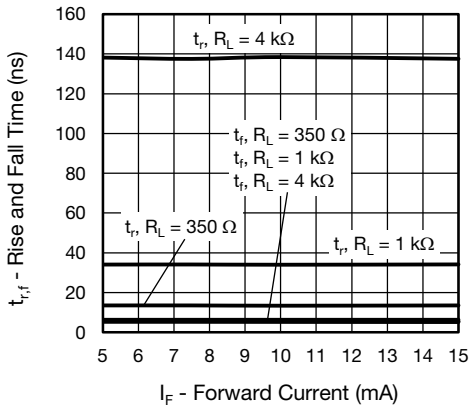


Fig. 19 - Rise and Fall Time vs. Forward Current

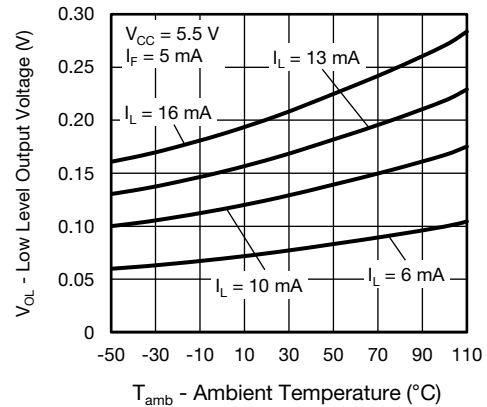


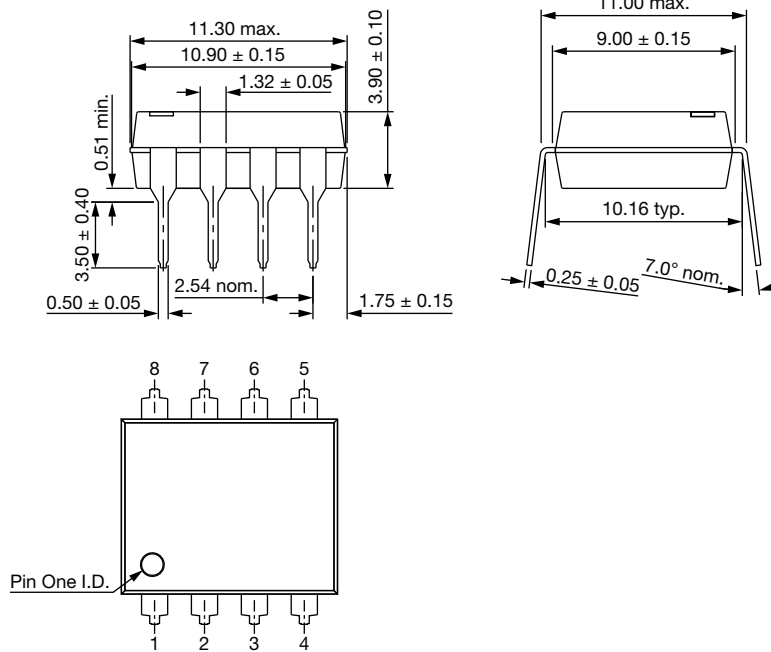
Fig. 21 - Low Level Output Voltage vs. Ambient Temperature



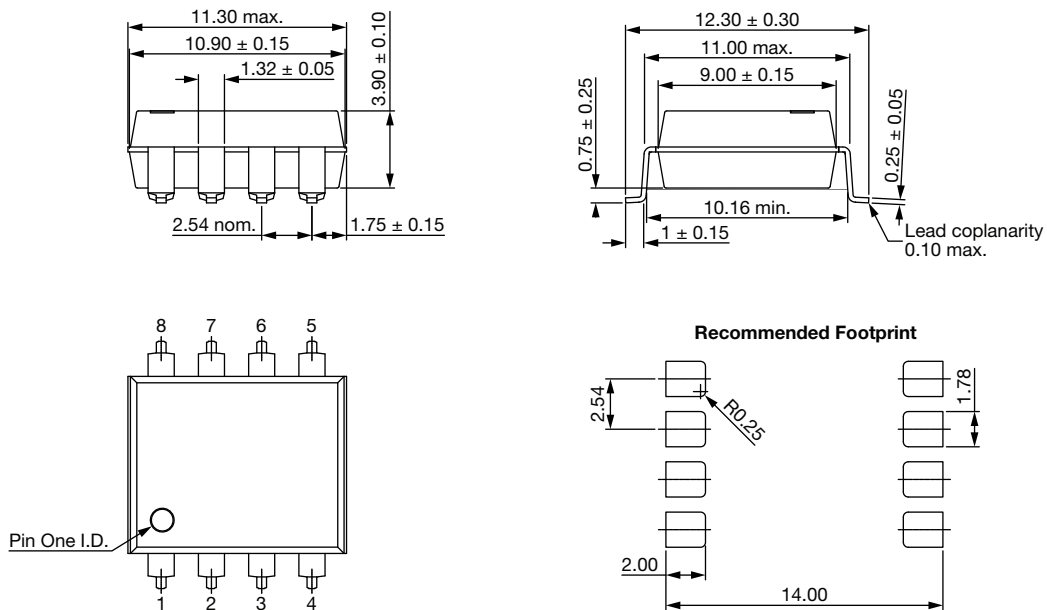


### PACKAGE DIMENSIONS in millimeters

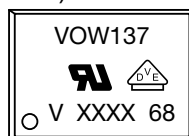
#### DIP-8, widebody



#### SMD-8, widebody, (Option 7)



#### PACKAGE MARKING (Example of VOW137-X017T)



#### Notes

- XXXX = LMC (lot marking code)
- Tape and reel suffix (T) is not part of the package marking

**PACKING INFORMATION** (Tape and Reel)

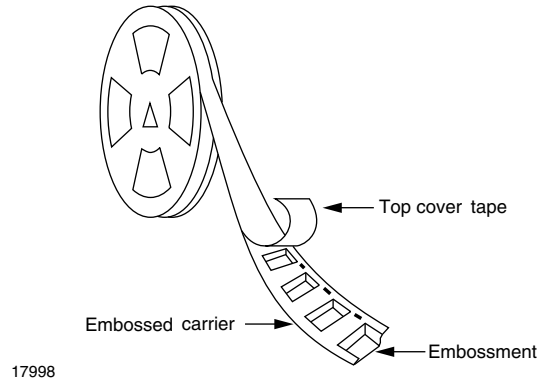
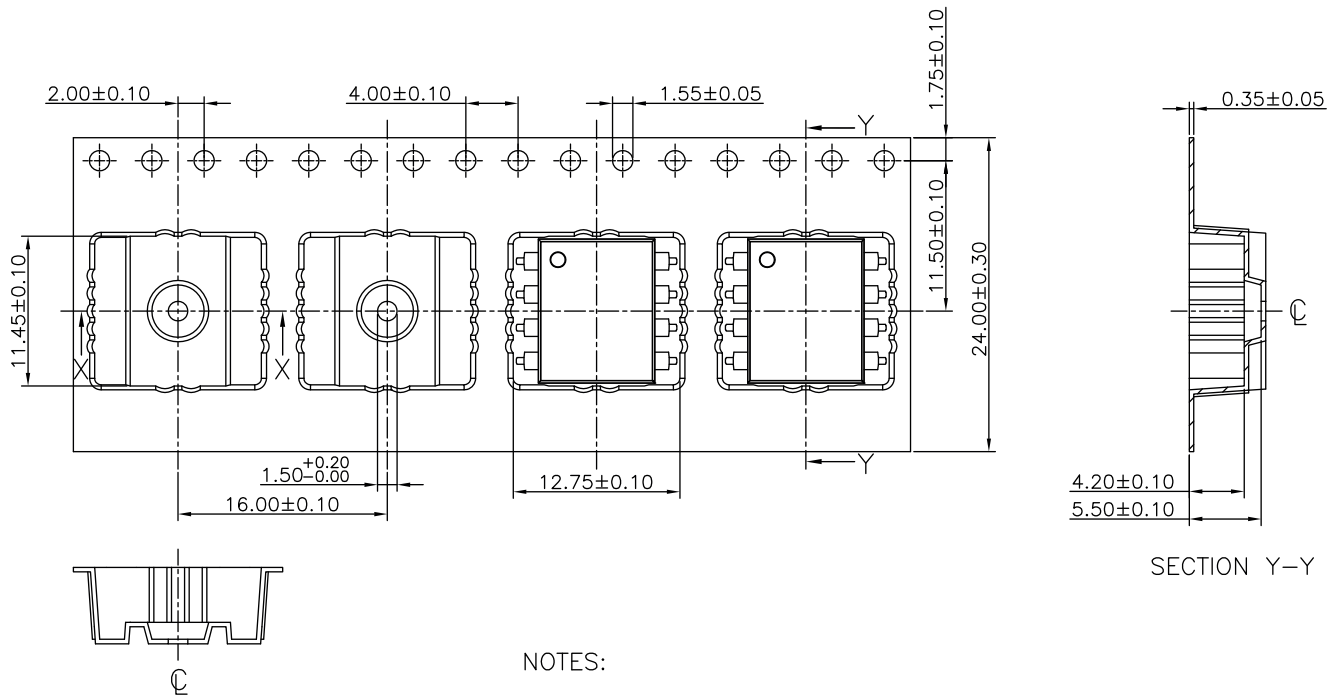


Fig. 22 - Tape and Reel Shipping Medium



NOTES:

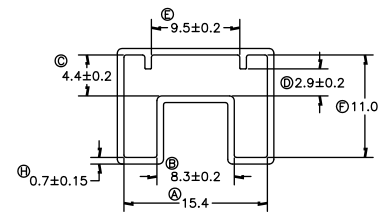
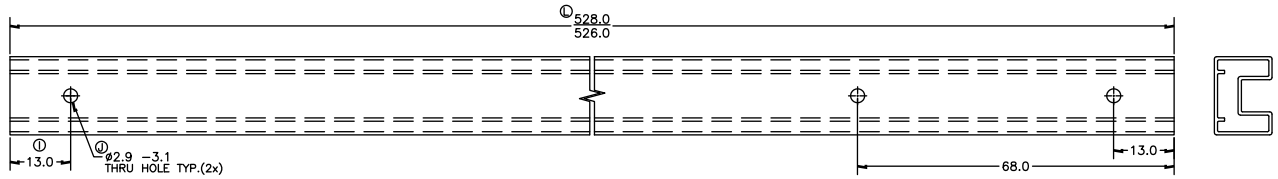
- 1) CUMULATIVE TOLERANCE OF 10 SPROCKET HOLES IS  $\pm 0.20$ .

Fig. 23 - Tape and Reel Packing Option 7 (750 parts per reel)



PACKING INFORMATION (Tubes)

| DEVICE PER TUBE |            |          |           |
|-----------------|------------|----------|-----------|
| TYPE            | UNITS/TUBE | TUBE/BOX | UNITS/BOX |
| DIP-8, widebody | 40         | 30       | 1200      |



|               |       |
|---------------|-------|
| TUBE COLOUR:  | CLEAR |
| PRINT COLOUR: | -     |

1. ALL DIMENSIONS ARE IN MILLIMETERS, U.O.S.

1. ALL TUBE TOLERANCES TO BE  $\pm 0.25$  UNLESS OTHERWISE SPECIFIED.
2. ALL RADII AND ANGLES REFERENCE ONLY, UNLESS OTHERWISE SPECIFIED.



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