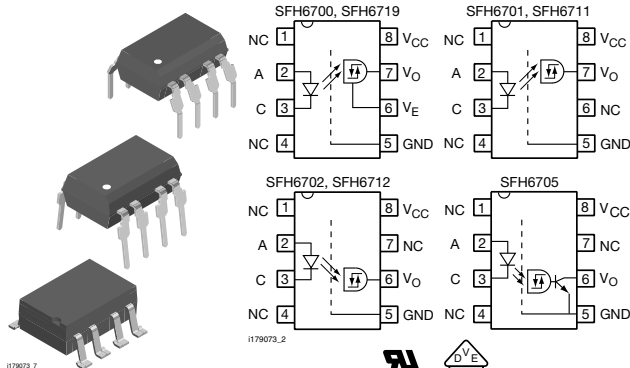




## High Speed Optocoupler, 5 MBd, 1 kV/μs dV/dt



### FEATURES

- Data rate 5 Mbits/s (2.5 Mbit/s over temperature)
- Buffer
- Isolation test voltage, 5300 V<sub>RMS</sub> for 1 min
- TTL, LSTTL and CMOS compatible
- Internal shield for very high common mode transient immunity
- Wide supply voltage range (4.5 V to 15 V)
- Low input current (1.6 mA to 5 mA)
- Three state output (SFH6700, SFH6719)
- Totem pole output (SFH6701, SFH6702, SFH6711, SFH6712)
- Open collector output (SFH6705)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

### DESCRIPTION

The SFH67xx high speed optocoupler series consists of a GaAlAs infrared emitting diode, optically coupled with an integrated photo detector. The detector incorporates a Schmitt-Trigger stage for improved noise immunity. Using the enable input, the output can be switched to the high ohmic state, which is necessary for data bus applications. A Faraday shield provides a common mode transient immunity of 1000 V/μ at V<sub>CM</sub> = 50 V for SFH6700, SFH6701, SFH6702, SFH6705 and 2500 V/μ at V<sub>CM</sub> = 400 V for SFH6711, SFH6712, SFH6719.

The SFH67xx uses an industry standard DIP-8 package. With standard lead bending, creepage distance and clearance of ≥ 7 mm with lead bending options 6, 7, and 9 ≥ 8 mm are achieved.

### APPLICATIONS

- Industrial control
- Replace pulse transformers
- Routine logic interfacing
- Motion/power control
- High speed line receiver
- Microprocessor system interfaces
- Computer peripheral interfaces

### AGENCY APPROVALS

- UL1577
- DIN EN 60747-5-5 (VDE 0884) available with option 1 (pending)
- cUL
- CQC

| ORDERING INFORMATION  |                    |                              |                              |                   |
|---|--------------------|------------------------------|------------------------------|-------------------|
| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px;">S</div> <div style="border: 1px solid black; padding: 2px;">F</div> <div style="border: 1px solid black; padding: 2px;">H</div> <div style="border: 1px solid black; padding: 2px;">6</div> <div style="border: 1px solid black; padding: 2px;">7</div> <div style="border: 1px solid black; padding: 2px;">#</div> <div style="border: 1px solid black; padding: 2px;">#</div> <div style="border: 1px solid black; padding: 2px;">-</div> <div style="border: 1px solid black; padding: 2px;">X</div> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">#</div> <div style="border: 1px solid black; padding: 2px;">T</div> </div> <div style="text-align: center; margin-left: 20px;"> <p>7.62 mm</p> <p>10.16 mm</p> <p>&gt; 0.7 mm</p> <p>&gt; 0.1 mm</p> </div> </div> |                    |                              |                              |                   |
| PART NUMBER   |                    | PACKAGE OPTION               |                              | TAPE AND REEL     |
| AGENCY CERTIFIED/PACKAGE  | THREE STATE        | TOTEM POLE                   |                              | OPEN COLLECTOR    |
| <b>UL</b>   |                    |                              |                              |                   |
| DIP-8   | SFH6700<br>SFH6719 | SFH6701<br>SFH6702           | SFH6711<br>SFH6712           | SFH6705<br>-      |
| DIP-8, 400 mil, option 6  | -                  | SFH6702-X006                 | -                            | SFH6705-X006      |
| SMD-8, option 7   | -                  | SFH6701-X007<br>SFH6702-X007 | SFH6711-X007<br>SFH6712-X007 | SFH6705-X007<br>- |
| SMD-8, option 9   | SFH6700-X009       | SFH6702-X009T <sup>(1)</sup> | SFH6701-X009T <sup>(1)</sup> | -                 |

### Note

- Also available in tubes. To order, do not add T on end



| <b>TRUTH TABLE</b> (positive logic) |                 |               |               |
|-------------------------------------|-----------------|---------------|---------------|
| <b>PARTS</b>                        | <b>IR DIODE</b> | <b>ENABLE</b> | <b>OUTPUT</b> |
| SFH6700                             | on              | H             | Z             |
|                                     | off             | H             | Z             |
| SFH6719                             | on              | L             | H             |
|                                     | off             | L             | L             |
| SFH6701                             | on              |               | H             |
|                                     | off             |               | L             |
| SFH6702                             | on              |               | H             |
|                                     | off             |               | L             |
| SFH6705                             | on              |               | H             |
|                                     | off             |               | L             |
| SFH6711                             | on              |               | H             |
|                                     | off             |               | L             |
| SFH6712                             | on              |               | H             |
|                                     | off             |               | L             |

| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |  |               |               |                    |
|--|--|---------------|---------------|--------------------|
| <b>PARAMETER</b>   | <b>TEST CONDITION</b>  | <b>SYMBOL</b> | <b>VALUE</b>  | <b>UNIT</b>        |
| <b>INPUT</b>   |  |               |               |                    |
| Reverse voltage  |  | $V_R$         | 3             | V                  |
| DC forward current   |  | $I_F$         | 10            | mA                 |
| Surge forward current  | $t \leq 1\text{ }\mu\text{s}$                                  | $I_{FSM}$     | 1             | A                  |
| Power dissipation  |  | $P_{diss}$    | 20            | mW                 |
| <b>OUTPUT</b>  |  |               |               |                    |
| Supply voltage   |  | $V_{CC}$      | - 0.5 to + 15 | V                  |
| Three state enable voltage<br>(SFH6700, SFH6719 only)  |  | $V_{EN}$      | - 0.5 to + 15 | V                  |
| Output voltage   |  | $V_O$         | - 0.5 to + 15 | V                  |
| Average output current   |  | $I_O$         | 25            | mA                 |
| Power dissipation  |  | $P_{diss}$    | 100           | mW                 |
| <b>COUPLER</b>   |  |               |               |                    |
| Storage temperature range  |  | $T_{stg}$     | - 55 to + 150 | $^{\circ}\text{C}$ |
| Ambient temperature range  |  | $T_{amb}$     | + 85          | $^{\circ}\text{C}$ |
| Lead soldering temperature   | $t = 10\text{ s}$  | $T_{sld}$     | 260           | $^{\circ}\text{C}$ |
| Isolation test voltage   | $t = 1\text{ min}$   | $V_{ISO}$     | 5300          | $V_{RMS}$          |
| Pollution degree   |  |               | 2             |                    |
| Creepage distance and clearance  | Standard lead bending  |               | 7             | mm                 |
|  | Options 6, 7, 9  |               | 8             | mm                 |
| Comparative tracking index per DIN IEC 112/VDE 0303, part 1  |  |               | 175           |                    |
| Isolation resistance   | $V_{IO} = 500\text{ V}, T_{amb} = 25\text{ }^{\circ}\text{C}$  | $R_{IO}$      | $10^{12}$     | $\Omega$           |
|  | $V_{IO} = 500\text{ V}, T_{amb} = 100\text{ }^{\circ}\text{C}$ | $R_{IO}$      | $10^{11}$     | $\Omega$           |

**Note**

- 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

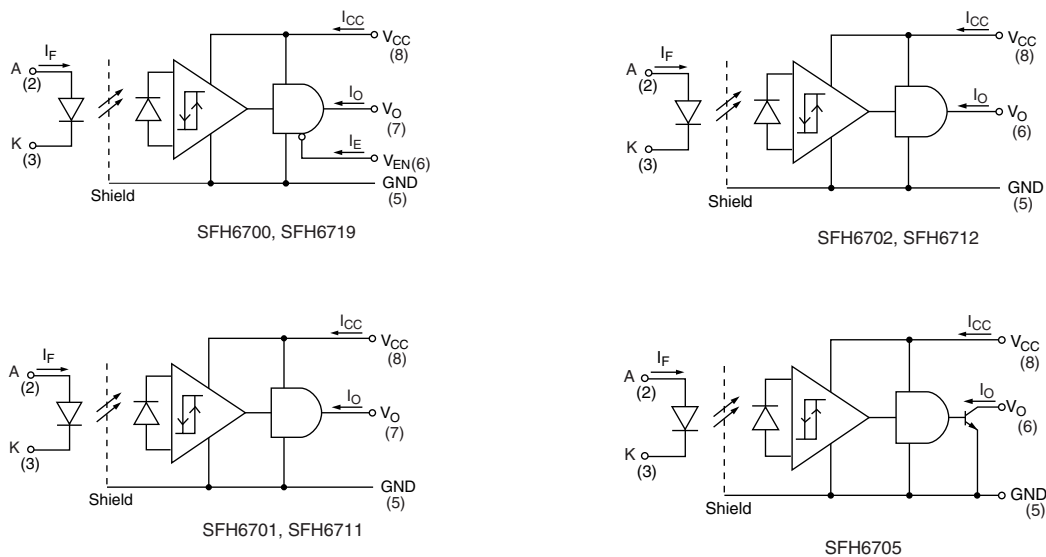


Fig. 1 - Schematics

| RECOMMENDED OPERATING CONDITIONS |                          |         |            |                    |      |      |              |
|----------------------------------|--------------------------|---------|------------|--------------------|------|------|--------------|
| PARAMETER                        | TEST CONDITION           | PART    | SYMBOL     | MIN.               | TYP. | MAX. | UNIT         |
| Supply voltage                   |                          |         | $V_{CC}$   | 4.5                |      | 15   | V            |
| Enable voltage high              |                          | SFH6700 | $V_{EH}$   | 2                  |      | 15   | V            |
|                                  |                          | SFH6719 | $V_{EH}$   | 2                  |      | 15   | V            |
| Enable voltage low               |                          | SFH6700 | $V_{EL}$   | 0                  |      | 0.8  | V            |
|                                  |                          | SFH6719 | $V_{EL}$   | 0                  |      | 0.8  | V            |
| Forward input current            |                          |         | $I_{Fon}$  | 1.6 <sup>(2)</sup> |      | 5    | mA           |
|                                  |                          |         | $I_{Foff}$ |                    |      | 0.1  | mA           |
| Operating temperature            |                          |         | $T_{amb}$  | - 40               |      | 85   | °C           |
| Output pull-up resistor          |                          | SFH6705 | $R_L$      | 350                |      | 4    | k $\Omega$   |
| Fan output                       | $R_L = 1\text{ k}\Omega$ | SFH6705 | N          |                    |      | 16   | LS TTL loads |

**Notes**

- A 0.1  $\mu\text{F}$  bypass capacitor connected between pins 5 and 8 must be used
- (1) We recommended using a 2.2 mA to permit at least 20 % CTR degradation guard band

| ELECTRICAL CHARACTERISTICS                 |  |            |      |      |      |               |
|--|--|------------|------|------|------|---------------|
| PARAMETER                                  | TEST CONDITION   | SYMBOL     | MIN. | TYP. | MAX. | UNIT          |
| <b>INPUT</b>                               |  |            |      |      |      |               |
| Forward voltage                            | $I_F = 5\text{ mA}$                                      | $V_F$      |      | 1.6  | 1.75 | V             |
|  | $I_F = 5\text{ mA}$                                      | $V_F$      |      |      | 1.8  | V             |
| Input current hysteresis                   | $V_{CC} = 5\text{ V}, I_{HYS} = I_{Fon} - I_{Foff}$      | $I_{HYS}$  |      | 0.1  |      | mA            |
| Reverse current                            | $V_R = 3\text{ V}$                                       | $I_R$      |      | 0.5  | 10   | $\mu\text{A}$ |
| Capacitance                                | $V_R = 0\text{ V}, f = 1\text{ MHz}$                     | $C_O$      |      | 60   |      | pF            |
| Thermal resistance                         |  | $R_{thJA}$ |      | 700  |      | K/W           |
| <b>OUTPUT</b>                              |  |            |      |      |      |               |
| Logic low output voltage                   | $I_{OL} = 6.4\text{ mA}$                                 | $V_{OL}$   |      |      | 0.5  | V             |
| Logic high output voltage (except SFH6705) | $I_{OH} = 2.6\text{ mA}, V_{OH} = V_{CC} - 1.8\text{ V}$ |            | 2.4  |      |      | V             |



| ELECTRICAL CHARACTERISTICS                                     |  |            |           |       |      |               |
|--|--|------------|-----------|-------|------|---------------|
| PARAMETER  | TEST CONDITION   | SYMBOL     | MIN.      | TYP.  | MAX. | UNIT          |
| <b>OUTPUT</b>  |  |            |           |       |      |               |
| Output leakage current ( $V_{OUT} > V_{CC}$ ) (except SFH6705) | $V_O = 5.5\text{ V}, V_{CC} = 4.5\text{ V}, I_F = 5\text{ mA}$ | $I_{OHH}$  |           | 0.5   | 100  | $\mu\text{A}$ |
|  | $V_O = 15\text{ V}, V_{CC} = 4.5\text{ V}, I_F = 5\text{ mA}$  | $I_{OHH}$  |           | 1     | 500  | $\mu\text{A}$ |
| Output leakage current (SFH6705 only)                          | $V_O = 5.5\text{ V}, V_{CC} = 5.5\text{ V}, I_F = 5\text{ mA}$ | $I_{OHH}$  |           | 0.5   | 100  | $\mu\text{A}$ |
|  | $V_O = 15\text{ V}, V_{CC} = 15\text{ V}, I_F = 5\text{ mA}$   | $I_{OHH}$  |           | 1     | 500  | $\mu\text{A}$ |
| Logic high enable voltage (SFH6700/19 only)                    |  | $V_{EH}$   | 2         |       |      | V             |
| Logic low enable voltage (SFH6700/19 only)                     |  | $V_{EL}$   |           |       | 0.8  | V             |
| Logic high enable current (SFH6700/19 only)                    | $V_{EN} = 2.7\text{ V}$  | $I_{EH}$   |           |       | 20   | $\mu\text{A}$ |
|  | $V_{EN} = 5.5\text{ V}$  | $I_{EH}$   |           |       | 100  | $\mu\text{A}$ |
|  | $V_{EN} = 15\text{ V}$   | $I_{EH}$   |           | 0.001 | 250  | $\mu\text{A}$ |
| Logic low enable current (SFH6700/19 only)                     | $V_{EN} = 0.4\text{ V}$  | $I_{EL}$   | - 320     | - 50  |      | $\mu\text{A}$ |
| High impedance state output current (SFH6700/19 only)          | $V_O = 0.4\text{ V}, V_{EN} = 2\text{ V}, I_F = 5\text{ mA}$   | $I_{OZL}$  | - 20      |       |      | $\mu\text{A}$ |
|  | $V_O = 2.4\text{ V}, V_{EN} = 2\text{ V}, I_F = 0\text{ mA}$   | $I_{OZH}$  |           |       | 20   | $\mu\text{A}$ |
|  | $V_O = 5.5\text{ V}, V_{EN} = 2\text{ V}, I_F = 0\text{ mA}$   | $I_{OZH}$  |           | 0.001 | 500  | $\mu\text{A}$ |
| Logic low supply current                                       | $V_{CC} = 5.5\text{ V}, I_F = 0$                               | $I_{CCL}$  |           | 3.7   | 6    | mA            |
|  | $V_{CC} = 15\text{ V}, I_F = 0$                                | $I_{CCL}$  |           | 4.1   | 6.5  | mA            |
| Logic high supply current                                      | $V_{CC} = 5.5\text{ V}, I_F = 5\text{ mA}$                     | $I_{CCH}$  |           | 3.4   | 4    | mA            |
|  | $V_{CC} = 15\text{ V}, I_F = 5\text{ mA}$                      | $I_{CCH}$  |           | 3.7   | 5    | mA            |
| Logic low short circuit output current <sup>(1)</sup>          | $V_O = V_{CC} = 5.5\text{ V}, I_F = 0$                         | $I_{OSL}$  | 25        |       |      | mA            |
|  | $V_O = V_{CC} = 15\text{ V}, I_F = 0$                          | $I_{OSL}$  | 40        |       |      | mA            |
| Logic high short circuit output current <sup>(1)</sup>         | $V_{CC} = 5.5\text{ V}, V_O = 0\text{ V}, I_F = 5$             | $I_{OSL}$  |           |       | - 10 | mA            |
|  | $V_{CC} = 15\text{ V}, V_O = 0\text{ V}, I_F = 5$              | $I_{OSL}$  |           |       | - 25 | mA            |
| Thermal resistance   |  | $R_{thJA}$ |           | 300   |      | K/W           |
| <b>COUPLER</b>   |  |            |           |       |      |               |
| Capacitance (input to output)                                  | $f = 1\text{ MHz}$ , pins 1 to 4 and 5 to 8 shorted together   | $C_{IO}$   |           | 0.6   |      | pF            |
| Isolation resistance   | $V_{IO} = 500\text{ V}, T_{amb} = 25\text{ }^\circ\text{C}$    | $R_{IO}$   | $10^{12}$ |       |      | $\Omega$      |
|  | $V_{IO} = 500\text{ V}, T_{amb} = 100\text{ }^\circ\text{C}$   | $R_{IO}$   | $10^{11}$ |       |      | $\Omega$      |

**Notes**

- $40\text{ }^\circ\text{C} \leq T_{amb} \leq 85\text{ }^\circ\text{C}$ ;  $4.5\text{ V} \leq V_{CC} \leq 15\text{ V}$ ;  $1.6\text{ mA} \leq I_{Fon} \leq 5\text{ mA}$ ;  $2 \leq V_{EH} \leq 15\text{ V}$ ;  $0 \leq V_{EL} \leq 0.8\text{ V}$ ;  $0\text{ mA} \leq I_{Foff} \leq 0.1\text{ mA}$ .  
Typical values:  $T_{amb} = 25\text{ }^\circ\text{C}$ ;  $V_{CC} = 5\text{ V}$ ;  $I_{Fon} = 3\text{ mA}$  unless otherwise specified. 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.
- <sup>(1)</sup> Output short circuit time  $\leq 10\text{ ms}$ .

| SWITCHING CHARACTERISTICS   |                           |      |           |      |      |      |      |
|---|---------------------------|------|-----------|------|------|------|------|
| PARAMETER   | TEST CONDITION            | PART | SYMBOL    | MIN. | TYP. | MAX. | UNIT |
| Propagation delay time to logic low output level, SFH6700, SFH6701, SFH6702, SFH6711, SFH6712, SFH6719 <sup>(1)</sup> | Without peaking capacitor |      | $t_{PHL}$ |      | 120  |      | ns   |
|   | With peaking capacitor    |      | $t_{PHL}$ |      | 115  | 300  | ns   |
|   |                           |      | $t_{PLH}$ |      | 125  |      | ns   |
|   |                           |      | $t_{PLH}$ |      | 90   | 300  | ns   |
| Output enable time to logic high (SFH6700, SFH6719) <sup>(1)</sup>  |                           |      | $t_{PZH}$ |      | 20   |      | ns   |
| Output enable time to logic low (SFH6700, SFH6719) <sup>(1)</sup>   |                           |      | $t_{PZL}$ |      | 25   |      | ns   |



| SWITCHING CHARACTERISTICS  |                           |         |           |      |      |      |      |
|--|---------------------------|---------|-----------|------|------|------|------|
| PARAMETER  | TEST CONDITION            | PART    | SYMBOL    | MIN. | TYP. | MAX. | UNIT |
| Output disable time from logic low (SFH6700, SFH6719) <sup>(1)</sup> |                           |         | $t_{PLZ}$ |      | 50   |      | ns   |
| Output rise time <sup>(1)</sup>                                      | 10 % to 90 %              |         | $t_r$     |      | 40   |      | ns   |
| Output fall time <sup>(1)</sup>                                      | 90 % to 10 %              |         | $t_f$     |      | 10   |      | ns   |
| Propagation delay time to logic low output level <sup>(3)</sup>      | Without peaking capacitor | SFH6705 | $t_{PHL}$ |      | 115  |      | ns   |
|  | With peaking capacitor    | SFH6705 | $t_{PHL}$ |      | 105  | 300  | ns   |
|  | Without peaking capacitor | SFH6705 | $t_{PLH}$ |      | 125  |      | ns   |
|  | With peaking capacitor    | SFH6705 | $t_{PLH}$ |      | 90   | 300  | ns   |
| Output rise time <sup>(3)</sup>                                      | 10 % to 90 %              |         | $t_r$     |      | 25   |      | ns   |
|  | 90 % to 10 %              |         | $t_f$     |      | 4    |      | ns   |

**Notes**

- $0\text{ }^{\circ}\text{C} \leq T_{amb} \leq 85\text{ }^{\circ}\text{C}$ ;  $4.5\text{ V} \leq V_{CC} \leq 15\text{ V}$ ;  $1.6\text{ mA} \leq I_{Fon} \leq 5\text{ mA}$ ;  $2 \leq V_{EH} \leq 15\text{ V}$  (SFH6700/19);  $0 \leq V_{EL} \leq 0.8\text{ V}$  (SFH6700, SFH6719);  $0\text{ mA} \leq I_{Foff} \leq 0.1\text{ mA}$

<sup>(1)</sup> Typical values:  $T_{amb} = 25\text{ }^{\circ}\text{C}$ ;  $V_{CC} = 5\text{ V}$ ;  $I_{Fon} = 3\text{ mA}$  unless otherwise specified <sup>(4)</sup>

<sup>(2)</sup> Typical values:  $T_{amb} = 25\text{ }^{\circ}\text{C}$ ,  $V_{CC} = 5\text{ V}$ ;  $I_{Fon} = 3\text{ mA}$ ;  $R_L = 390\ \Omega$  unless otherwise specified <sup>(4)</sup>

<sup>(3)</sup> A 0.1  $\mu\text{F}$  bypass capacitor connected between pins 5 and 8 must be used

| COMMON MODE TRANSIENT IMMUNITY            |   |         |                         |      |                  |      |                  |
|---|---|---------|-------------------------|------|------------------|------|------------------|
| PARAMETER                                 | TEST CONDITION                                    | PART    | SYMBOL                  | MIN. | TYP.             | MAX. | UNIT             |
| Logic high common mode transient immunity | $ V_{CM}  = 50\text{ V}$ , $I_F = 1.6\text{ mA}$  | SFH6700 | $ CM_H $ <sup>(1)</sup> | 1000 |                  |      | V/ $\mu\text{s}$ |
|   |   | SFH6701 | $ CM_H $ <sup>(1)</sup> | 1000 |                  |      | V/ $\mu\text{s}$ |
|   |   | SFH6702 | $ CM_H $ <sup>(1)</sup> | 1000 |                  |      | V/ $\mu\text{s}$ |
|   |   | SFH6705 | $ CM_H $ <sup>(1)</sup> | 1000 |                  |      | V/ $\mu\text{s}$ |
|   | $ V_{CM}  = 400\text{ V}$ , $I_F = 1.6\text{ mA}$ | SFH6711 | $ CM_H $ <sup>(1)</sup> | 2500 |                  |      | V/ $\mu\text{s}$ |
|   |   | SFH6712 | $ CM_H $ <sup>(1)</sup> | 2500 |                  |      | V/ $\mu\text{s}$ |
| Logic Low common mode transient immunity  | $ V_{CM}  = 50\text{ V}$ , $I_F = 0\text{ mA}$    | SFH6700 | $ CM_L $ <sup>(2)</sup> | 1000 |                  |      | V/ $\mu\text{s}$ |
|   |   | SFH6701 | $ CM_L $ <sup>(2)</sup> | 1000 |                  |      | V/ $\mu\text{s}$ |
|   |   | SFH6702 | $ CM_L $ <sup>(2)</sup> | 1000 |                  |      | V/ $\mu\text{s}$ |
|   | $ V_{CM}  = 400\text{ V}$ , $I_F = 0\text{ mA}$   | SFH6705 | $ CM_L $ <sup>(2)</sup> | 1000 |                  |      | V/ $\mu\text{s}$ |
|   |   | SFH6711 | $ CM_L $ <sup>(2)</sup> | 2500 |                  |      | V/ $\mu\text{s}$ |
|   |   | SFH6712 | $ CM_L $ <sup>(2)</sup> | 2500 |                  |      | V/ $\mu\text{s}$ |
| SFH6719                                   | $ CM_L $ <sup>(2)</sup>                           | 2500    |                         |      | V/ $\mu\text{s}$ |      |                  |

**Notes**

- $T_{amb} = 25\text{ }^{\circ}\text{C}$ ,  $V_{CC} = 5\text{ V}$

<sup>(1)</sup>  $CM_H$  is the maximum slew rate of a common mode voltage  $V_{CM}$  at which the output voltage remains at logic high level ( $V_O > 2\text{ V}$ )

<sup>(2)</sup>  $CM_L$  is the maximum slew rate of a common mode voltage  $V_{CM}$  at which the output voltage remains at logic high level ( $V_O < 0.8\text{ V}$ )



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

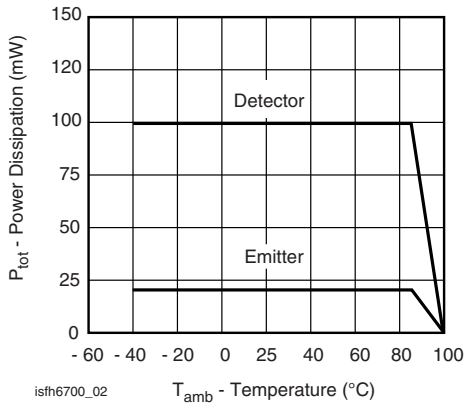


Fig. 2 - Permissible Total Power Dissipation vs. Temperature

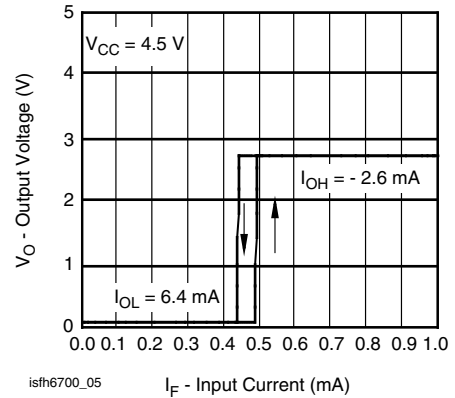


Fig. 5 - Typical Output Voltage vs. Forward Input Current (except SFH6705)

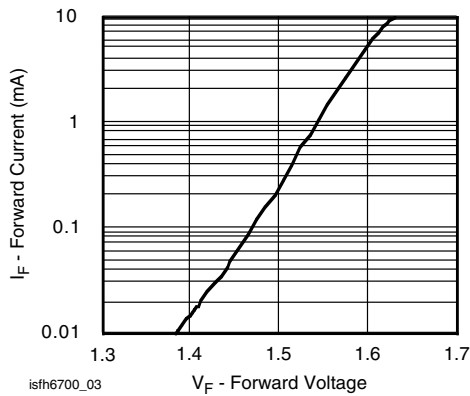


Fig. 3 - Typical Input Diode Forward Current vs. Forward Voltage

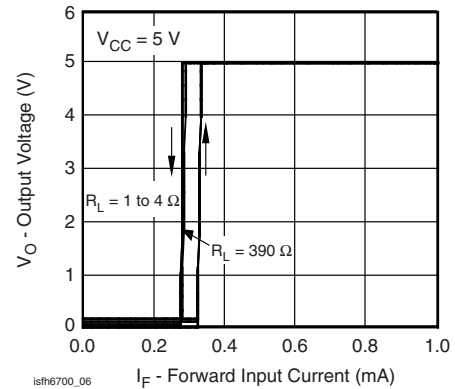


Fig. 6 - Typical Output Voltage vs. Forward Input Current (only SFH6705)

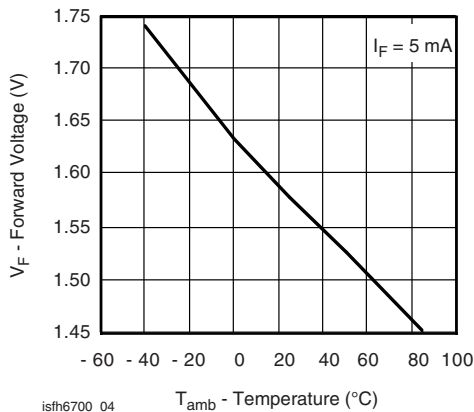


Fig. 4 - Typical Forward Input Voltage vs. Temperature

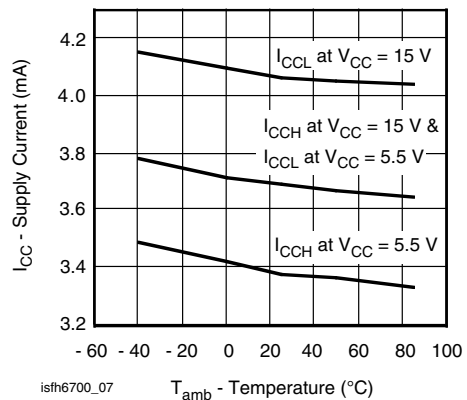


Fig. 7 - Typical Supply Current vs. Temperature

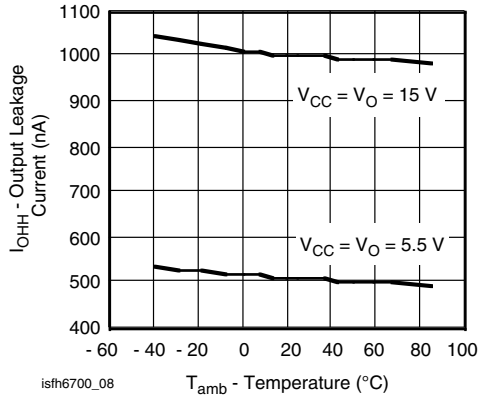


Fig. 8 - Typical Output Leakage Current vs. Temperature

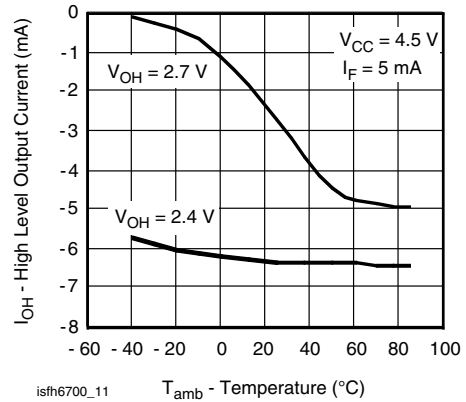


Fig. 11 - Typical High Level Output Current vs. Temperature (except SFH6705)

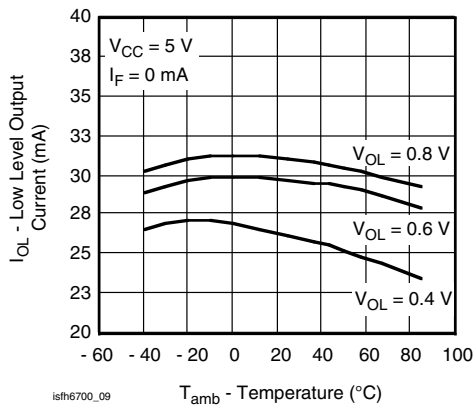


Fig. 9 - Typical Low Level Output Current vs. Temperature

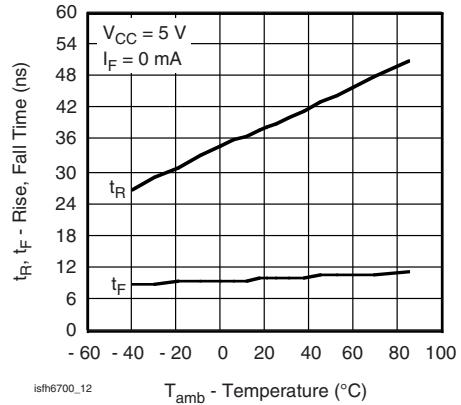


Fig. 12 - Typical Rise, Fall Time vs. Temperature (except SFH6705)

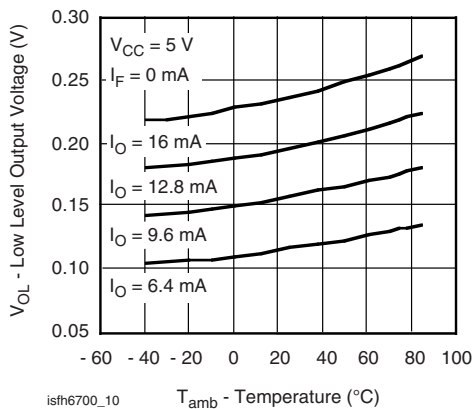


Fig. 10 - Typical Low Level Output Voltage vs. Temperature

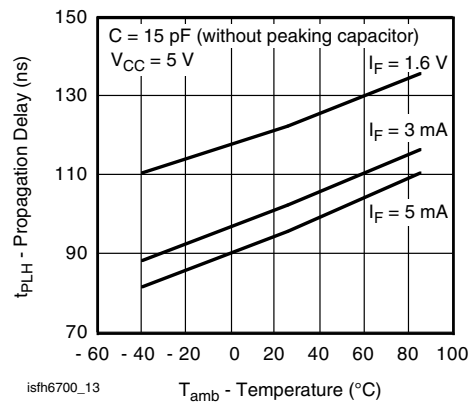


Fig. 13 - Typical Propagation Delay to Logic High vs. Temperature (except SFH6705)

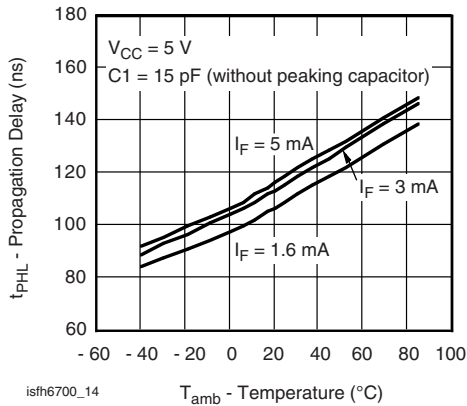


Fig. 14 - Typical Propagation Delay to Logic Low vs. Temperature (except SFH6705)

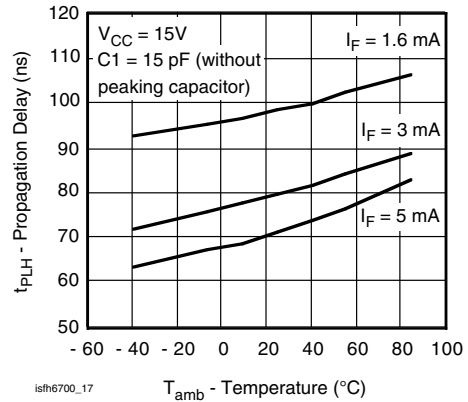


Fig. 17 - Typical Propagation Delays to Logic High vs. Temperature

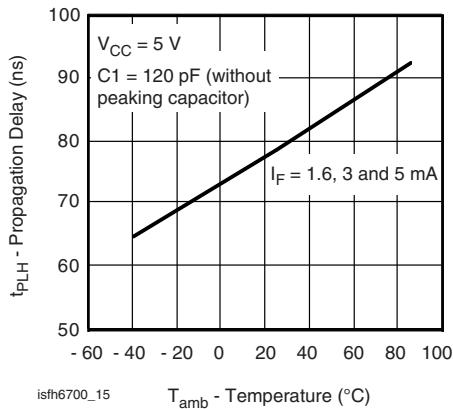


Fig. 15 - Typical Propagation Delays to Logic High vs. Temperature (except SFH6705)

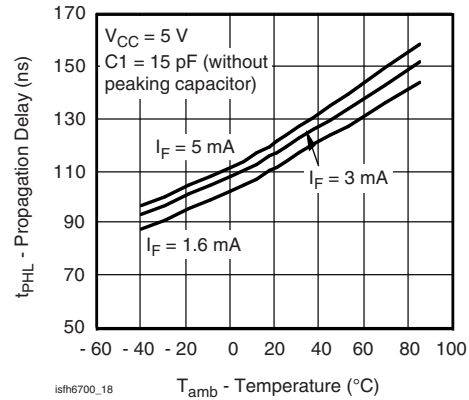


Fig. 18 - Typical Propagation Delays to Logic Low vs. Temperature

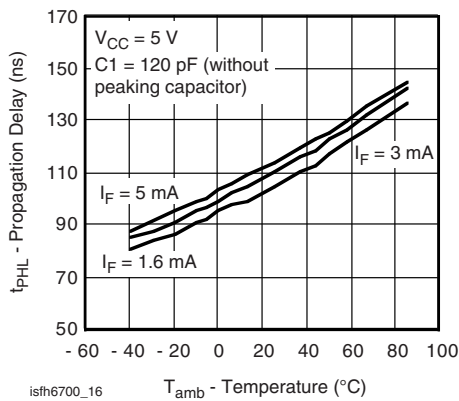


Fig. 16 - Typical Propagation Delay to Logic Low vs. Temperature

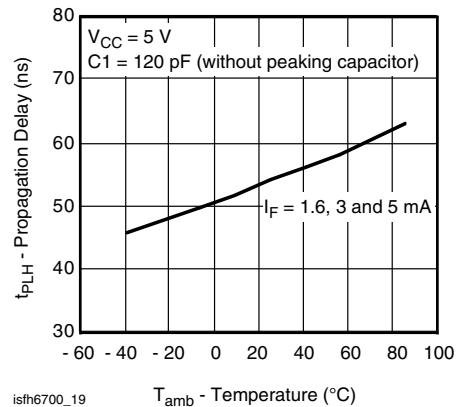


Fig. 19 - Typical Propagation Delays to Logic High vs. Temperature



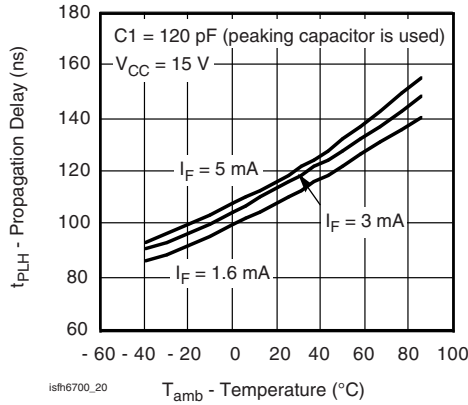


Fig. 20 - Typical Propagation Delays to Logic Low vs. Temperature (except SFH6705)

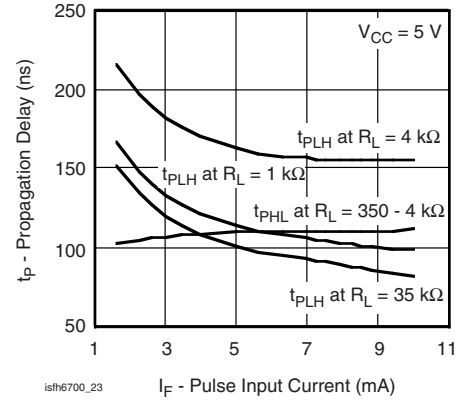


Fig. 23 - Typical Propagation Delays vs. Pulse Input Current (only SFH6705)

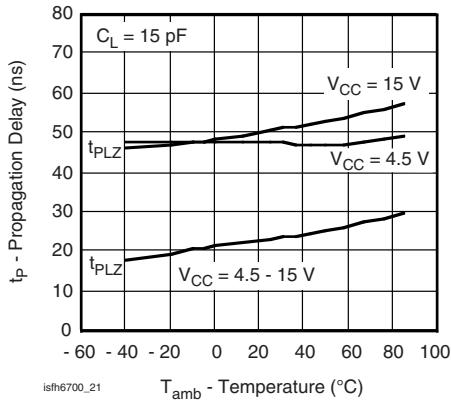


Fig. 21 - Typical Logic Low Enable Propagation Delays vs. Temperature (only SFH6700/11)

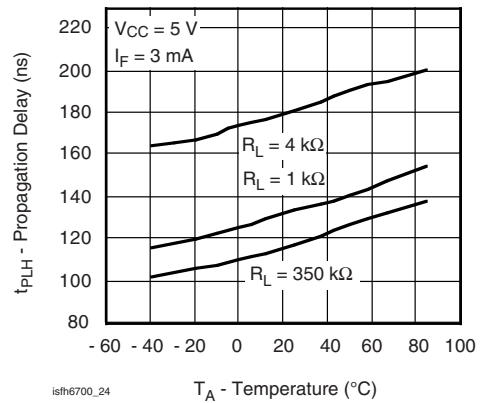


Fig. 24 - Typical Propagation Delays to High Level vs. Temperature (only SFH6705)

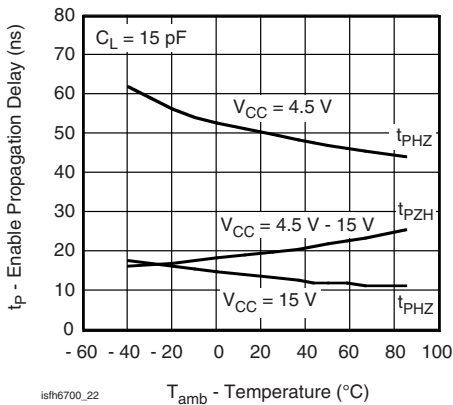


Fig. 22 - Typical Logic High Enable Propagation Delays vs. Temperature (only SFH6700/11)

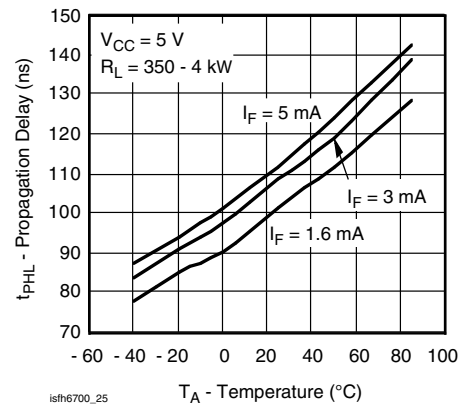


Fig. 25 - Typical Propagation Delays to Low Level vs. Temperature (only SFH6705)

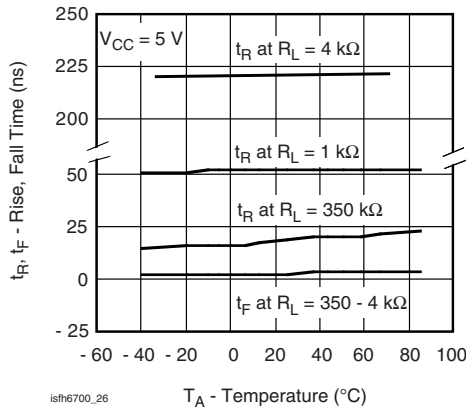
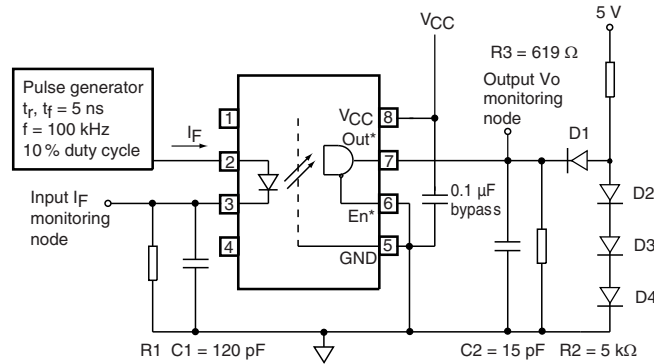


Fig. 26 - Typical Rise, Fall Time vs. Temperature (only SFH6705)



The probe and jig capacitances are included in C1 and C2 All diodes are 1N916 or 1N3064

|                  |         |        |       |  |
|------------------|---------|--------|-------|--|
| R1               | 2.15 kΩ | 1.1 kΩ | 681 Ω | * SFH6701, SFH6702, SFH6711, SFH6712 without V <sub>EN</sub> |
| I <sub>Fon</sub> | 1.6 mA  | 3 mA   | 5 mA  | * SFH6702, SFH6712 pin 6 V <sub>OUT</sub> and pin 7 NC       |

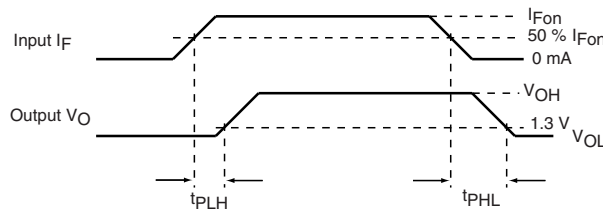
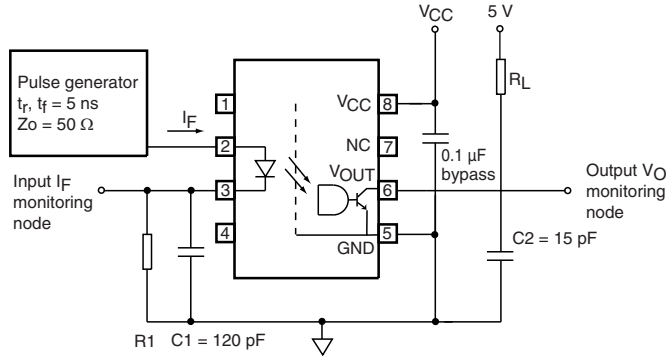
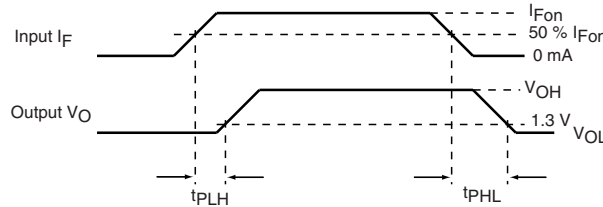


Fig. 27 - Test Circuit for t<sub>PLH</sub>, t<sub>PHL</sub>, t<sub>r</sub> and t<sub>f</sub>



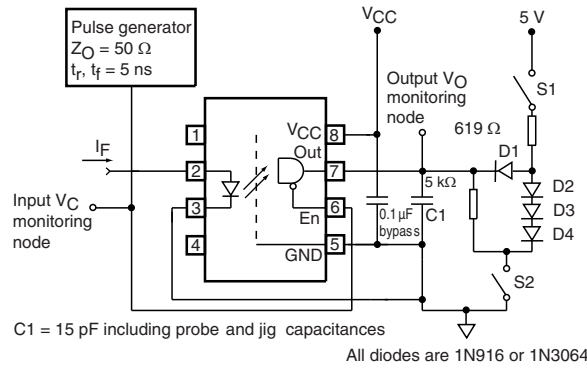
The probe and jig capacitances are included in C1 and C2

|                  |         |        |       |
|------------------|---------|--------|-------|
| R1               | 2.15 kΩ | 1.1 kΩ | 681 Ω |
| I <sub>Fon</sub> | 1.6 mA  | 3 mA   | 5 mA  |



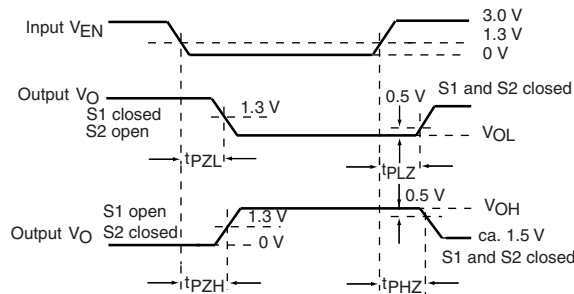
isfh6700\_28

Fig. 28 - Test Circuit for t<sub>PLH</sub>, t<sub>PHL</sub>, t<sub>r</sub> and - SFH6705



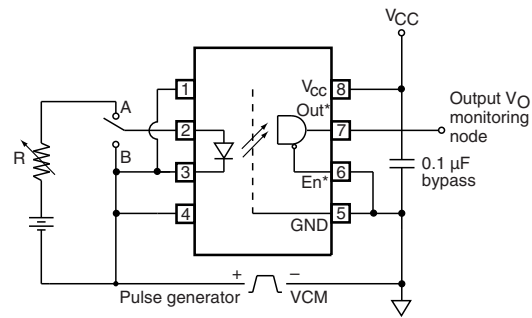
C1 = 15 pF including probe and jig capacitances

All diodes are 1N916 or 1N3064



isfh6700\_29

Fig. 29 - Test Circuit for t<sub>PHZ</sub>, t<sub>PZH</sub>, t<sub>PLZ</sub> and t<sub>PZL</sub> - SFH6700/19



\* SFH6701/02/11/12 without V<sub>EN</sub>  
 \* SFH6702/12 pin 6 V<sub>OUT</sub> and Pin 7 NC

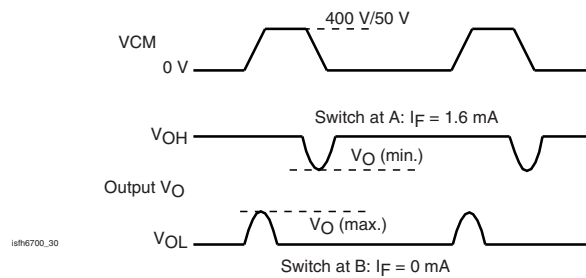


Fig. 30 - Test Circuit for Common Mode Transient Immunity and Typical Waveforms - SFH6700/01/02/11/12/19

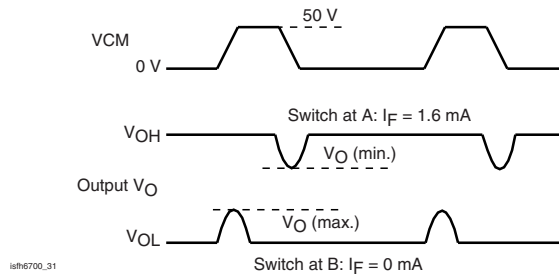
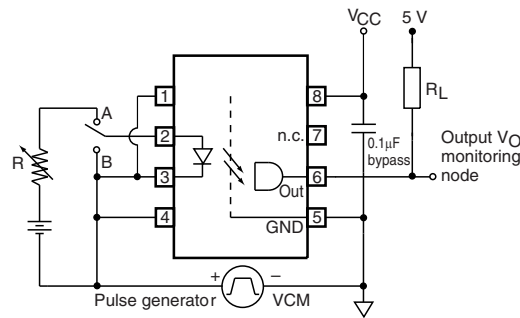
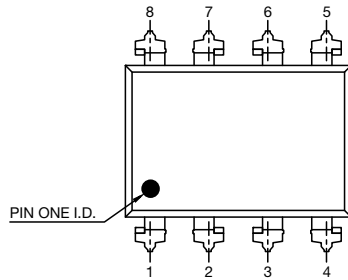
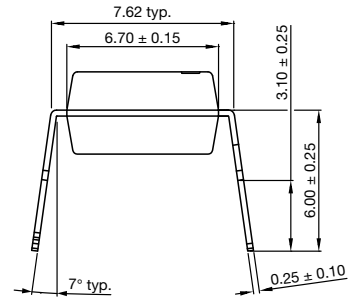
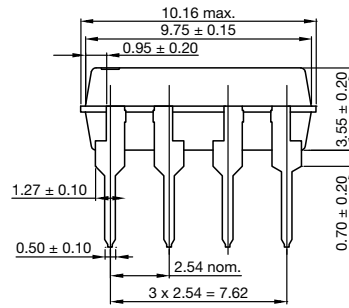


Fig. 31 - Test Circuit for Common Mode Transient Immunity and Typical Waveforms - SFH6705



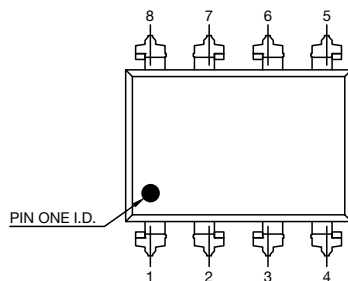
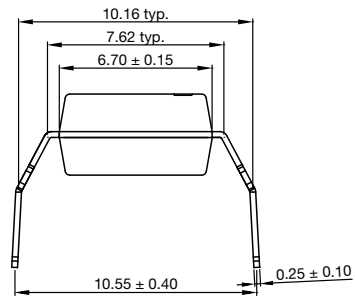
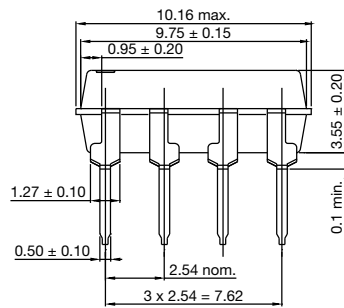
**PACKAGE DIMENSIONS** in millimeters

**Standard**



22672

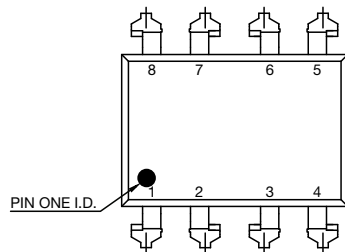
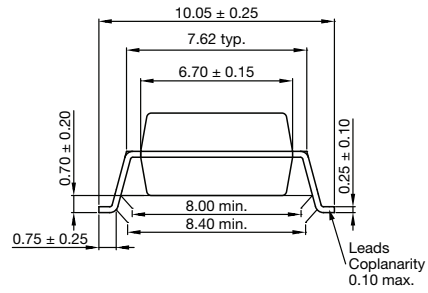
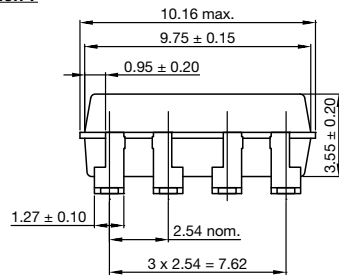
**Option 6**



22673

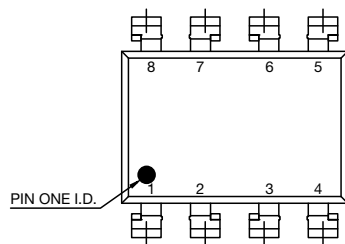
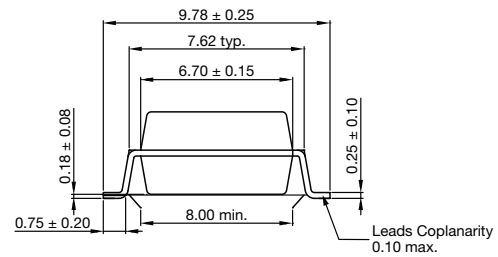
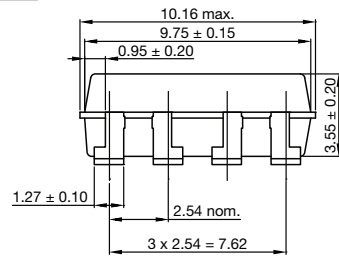


**Option 7**



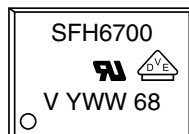
22674

**Option 9**



22675

**PACKAGE MARKING** (for example)



**Notes**

- The VDE logo is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking



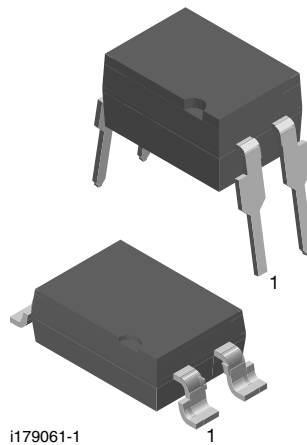
## Footprint and Schematic Information for SFH618A

The footprint and schematic symbols for the following parts can be accessed using the associated links. They are available in Eagle, Altium, KiCad, OrCAD / Allegro, Pulsonix, and PADS.

Note that the 3D models for these parts can be found on the Vishay product page.

| PART NUMBER    | FOOTPRINT / SCHEMATIC  |
|----------------|--|
| SFH618A-2      | <a href="http://www.snapeda.com/parts/SFH618A-2/Vishay/view-part">www.snapeda.com/parts/SFH618A-2/Vishay/view-part</a>           |
| SFH618A-3      | <a href="http://www.snapeda.com/parts/SFH618A-3/Vishay/view-part">www.snapeda.com/parts/SFH618A-3/Vishay/view-part</a>           |
| SFH618A-3X001  | <a href="http://www.snapeda.com/parts/SFH618A-3X001/Vishay/view-part">www.snapeda.com/parts/SFH618A-3X001/Vishay/view-part</a>   |
| SFH618A-3X006  | <a href="http://www.snapeda.com/parts/SFH618A-3X006/Vishay/view-part">www.snapeda.com/parts/SFH618A-3X006/Vishay/view-part</a>   |
| SFH618A-3X016  | <a href="http://www.snapeda.com/parts/SFH618A-3X016/Vishay/view-part">www.snapeda.com/parts/SFH618A-3X016/Vishay/view-part</a>   |
| SFH618A-3X017T | <a href="http://www.snapeda.com/parts/SFH618A-3X017T/Vishay/view-part">www.snapeda.com/parts/SFH618A-3X017T/Vishay/view-part</a> |
| SFH618A-4      | <a href="http://www.snapeda.com/parts/SFH618A-4/Vishay/view-part">www.snapeda.com/parts/SFH618A-4/Vishay/view-part</a>           |
| SFH618A-4X001  | <a href="http://www.snapeda.com/parts/SFH618A-4X001/Vishay/view-part">www.snapeda.com/parts/SFH618A-4X001/Vishay/view-part</a>   |
| SFH618A-4X016  | <a href="http://www.snapeda.com/parts/SFH618A-4X016/Vishay/view-part">www.snapeda.com/parts/SFH618A-4X016/Vishay/view-part</a>   |
| SFH618A-5      | <a href="http://www.snapeda.com/parts/SFH618A-5/Vishay/view-part">www.snapeda.com/parts/SFH618A-5/Vishay/view-part</a>           |
| SFH618A-5X007T | <a href="http://www.snapeda.com/parts/SFH618A-5X007T/Vishay/view-part">www.snapeda.com/parts/SFH618A-5X007T/Vishay/view-part</a> |
| SFH618A-5X016  | <a href="http://www.snapeda.com/parts/SFH618A-5X016/Vishay/view-part">www.snapeda.com/parts/SFH618A-5X016/Vishay/view-part</a>   |
| SFH618A-5X017T | <a href="http://www.snapeda.com/parts/SFH618A-5X017T/Vishay/view-part">www.snapeda.com/parts/SFH618A-5X017T/Vishay/view-part</a> |

For technical issues and product support, please contact [optocoupleranswers@vishay.com](mailto:optocoupleranswers@vishay.com).





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