





| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |  |           |                |                    |
|--|--|-----------|----------------|--------------------|
| PARAMETER  | TEST CONDITION   | SYMBOL    | VALUE          | UNIT               |
| <b>INPUT</b>   |  |           |                |                    |
| Reverse voltage  |  | $V_R$     | 6              | V                  |
| DC forward current   |  | $I_F$     | 60             | mA                 |
| Surge forward current  | $t_p \leq 10\text{ }\mu\text{s}$                               | $I_{FSM}$ | 2.5            | A                  |
| <b>OUTPUT</b>  |  |           |                |                    |
| Collector emitter voltage  |  | $V_{CEO}$ | 70             | V                  |
| Emitter collector voltage  |  | $V_{ECO}$ | 7              | V                  |
| Collector current  |  | $I_C$     | 50             | mA                 |
|  | $t_p \leq 1\text{ ms}$   | $I_C$     | 100            | mA                 |
| <b>COUPLER</b>   |  |           |                |                    |
| Isolation test voltage between emitter and detector  | $t = 1\text{ s}$   | $V_{ISO}$ | 5300           | $V_{RMS}$          |
| Creepage distance  |  |           | $\geq 7$       | mm                 |
| Clearance distance   |  |           | $\geq 7$       | mm                 |
| Insulation thickness between emitter and detector  |  |           | $\geq 0.4$     | mm                 |
| Comparative tracking index per DIN IEC112/VDE0303 part 1   |  | CTI       | $\geq 175$     |                    |
| Isolation resistance   | $V_{IO} = 500\text{ V}, T_{amb} = 25\text{ }^{\circ}\text{C}$  | $R_{IO}$  | $\geq 10^{12}$ | $\Omega$           |
|  | $V_{IO} = 500\text{ V}, T_{amb} = 100\text{ }^{\circ}\text{C}$ | $R_{IO}$  | $\geq 10^{11}$ | $\Omega$           |
| Storage temperature range  |  | $T_{stg}$ | - 55 to + 150  | $^{\circ}\text{C}$ |
| Ambient temperature range  |  | $T_{amb}$ | - 55 to +100   | $^{\circ}\text{C}$ |
| Soldering temperature <sup>(1)</sup>   | max. 10 s  | $T_{sld}$ | 260            | $^{\circ}\text{C}$ |

**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 (SMD).

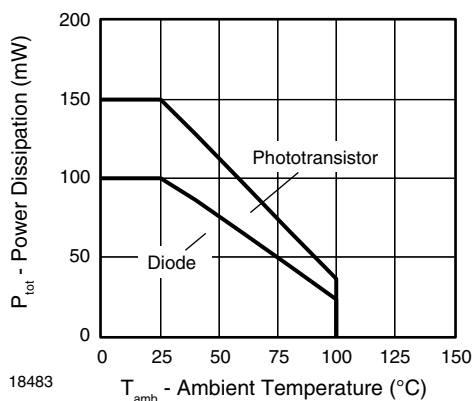


Fig. 1 - Permissible Power Dissipation vs. Ambient Temperature





| SWITCHING CHARACTERISTICS |   |           |           |      |      |      |               |
|---------------------------|---|-----------|-----------|------|------|------|---------------|
| PARAMETER                 | TEST CONDITION  | PART      | SYMBOL    | MIN. | TYP. | MAX. | UNIT          |
| <b>NON-SATURATED</b>      |   |           |           |      |      |      |               |
| Rise time                 | $I_F = 10 \text{ mA}$ , $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 75 \text{ } \Omega$ |           | $t_r$     |      | 2    |      | $\mu\text{s}$ |
| Fall time                 | $I_F = 10 \text{ mA}$ , $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 75 \text{ } \Omega$ |           | $t_f$     |      | 2    |      | $\mu\text{s}$ |
| Turn-on time              | $I_F = 10 \text{ mA}$ , $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 75 \text{ } \Omega$ |           | $t_{on}$  |      | 3    |      | $\mu\text{s}$ |
| Turn-off time             | $I_F = 10 \text{ mA}$ , $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 75 \text{ } \Omega$ |           | $t_{off}$ |      | 2.3  |      | $\mu\text{s}$ |
| Cut-off frequency         | $I_F = 10 \text{ mA}$ , $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 75 \text{ } \Omega$ |           | $f_{ctr}$ |      | 250  |      | kHz           |
| <b>SATURATED</b>          |   |           |           |      |      |      |               |
| Rise time                 | $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 1 \text{ k}\Omega$ , $I_F = 20 \text{ mA}$  | SFH6156-1 | $t_r$     |      | 2    |      | $\mu\text{s}$ |
|                           | $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 1 \text{ k}\Omega$ , $I_F = 10 \text{ mA}$  | SFH6156-2 | $t_r$     |      | 3    |      | $\mu\text{s}$ |
|                           |   | SFH6156-3 | $t_r$     |      | 3    |      | $\mu\text{s}$ |
| Fall time                 | $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 1 \text{ k}\Omega$ , $I_F = 20 \text{ mA}$  | SFH6156-1 | $t_f$     |      | 11   |      | $\mu\text{s}$ |
|                           | $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 1 \text{ k}\Omega$ , $I_F = 10 \text{ mA}$  | SFH6156-2 | $t_f$     |      | 14   |      | $\mu\text{s}$ |
|                           |   | SFH6156-3 | $t_f$     |      | 14   |      | $\mu\text{s}$ |
| Turn-on time              | $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 1 \text{ k}\Omega$ , $I_F = 20 \text{ mA}$  | SFH6156-1 | $t_{on}$  |      | 3    |      | $\mu\text{s}$ |
|                           | $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 1 \text{ k}\Omega$ , $I_F = 10 \text{ mA}$  | SFH6156-2 | $t_{on}$  |      | 4.2  |      | $\mu\text{s}$ |
|                           |   | SFH6156-3 | $t_{on}$  |      | 4.2  |      | $\mu\text{s}$ |
| Turn-off time             | $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 1 \text{ k}\Omega$ , $I_F = 20 \text{ mA}$  | SFH6156-1 | $t_{off}$ |      | 18   |      | $\mu\text{s}$ |
|                           | $V_{CC} = 5 \text{ V}$ , $T_A = 25 \text{ }^\circ\text{C}$ , $R_L = 1 \text{ k}\Omega$ , $I_F = 10 \text{ mA}$  | SFH6156-2 | $t_{off}$ |      | 23   |      | $\mu\text{s}$ |
|                           |   | SFH6156-3 | $t_{off}$ |      | 23   |      | $\mu\text{s}$ |

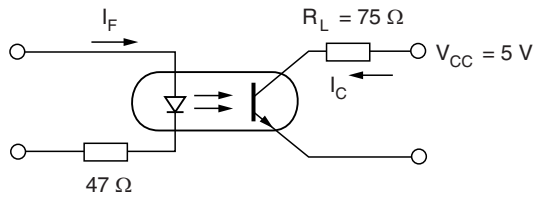
| SAFETY AND INSULATION RATINGS                        |                        |            |        |           |      |                  |  |
|--|------------------------|------------|--------|-----------|------|------------------|--|
| PARAMETER  | TEST CONDITION         | SYMBOL     | MIN.   | TYP.      | MAX. | UNIT             |  |
| Climatic classification (according to IEC 68 part 1) |                        |            |        | 55/100/21 |      |                  |  |
| Comparative tracking index                           |                        | CTI        | 175    |           | 399  |                  |  |
| $V_{IOTM}$   |                        | $V_{IOTM}$ | 10 000 |           |      | $V_{peak}$       |  |
| $V_{IORM}$   |                        | $V_{IORM}$ | 890    |           |      | $V_{peak}$       |  |
| $P_{SO}$   |                        | $P_{SO}$   |        |           | 400  | mW               |  |
| $I_{SI}$   |                        | $I_{SI}$   |        |           | 275  | mA               |  |
| $T_{SI}$   |                        | $T_{SI}$   |        |           | 175  | $^\circ\text{C}$ |  |
| Creepage distance                                    |                        |            | 7      |           |      | mm               |  |
| Clearance distance                                   |                        |            | 7      |           |      | mm               |  |
| Insulation thickness, reinforced rated               | per IEC 60950 2.10.5.1 |            | 0.4    |           |      | mm               |  |

**Note**

- As per IEC 60747-5-5, § 7.4.3.8.2, 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.

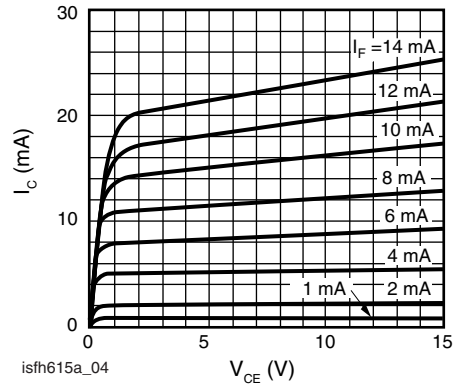


**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)



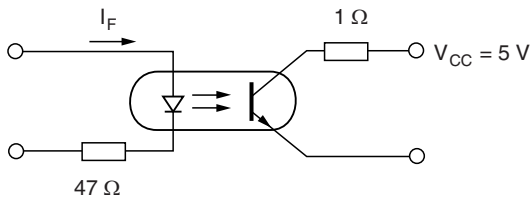
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Fig. 2 - Linear Operation (without Saturation)



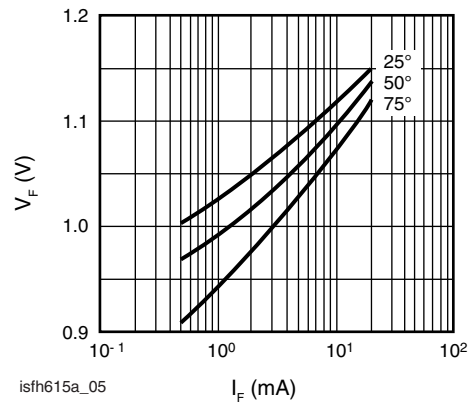
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Fig. 5 - Output Characteristics (Typ.) Collector Current vs. Collector Emitter Voltage



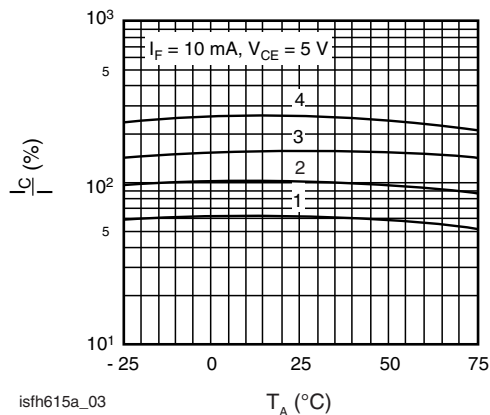
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Fig. 3 - Switching Operation (with Saturation)



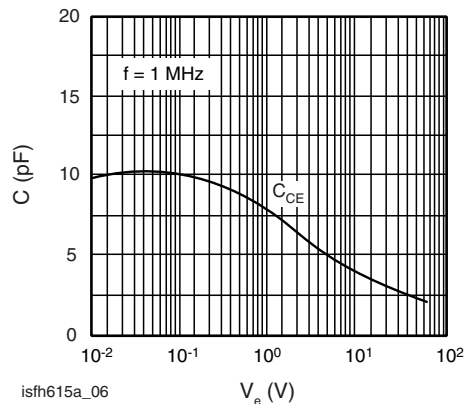
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Fig. 6 - Diode Forward Voltage (Typ.) vs. Forward Current



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Fig. 4 - Current Transfer Ratio (Typ.) vs. Temperature



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Fig. 7 - Transistor Capacitance (Typ.) vs. Collector Emitter Voltage

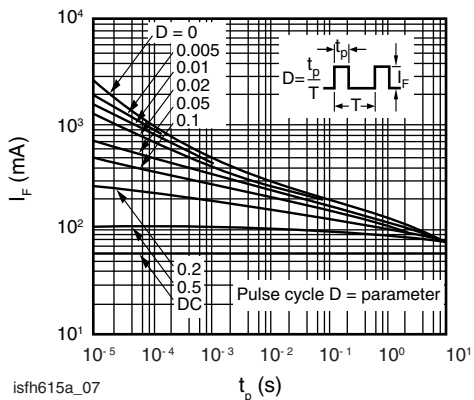


Fig. 8 - Permissible Pulse Handling Capability Forward Current vs. Pulse Width

**PACKAGE DIMENSIONS** millimeters



i178029\_11

**PACKAGE MARKING** (example of SFH6156-2X001T)



**Notes**

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



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