



| ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) | | | | |
|---|--|-------------------|--------------------|------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| INPUT | | | | |
| Reverse voltage | | V _R | 6 | V |
| DC forward current | | I _F | 60 | mA |
| Forward surge current | t _p ≤ 10 μs | I _{FSM} | 2.5 | A |
| LED power dissipation | at 25 °C | P _{diss} | 70 | mW |
| OUTPUT | | | | |
| Collector emitter voltage | | V _{CEO} | 70 | V |
| Emitter collector voltage | | V _{ECO} | 7 | V |
| Collector current | | I _C | 50 | mA |
| Collector peak current | t _p /T = 0.5, t _p ≤ 10 ms | I _{CM} | 100 | mA |
| Output power dissipation | at 25 °C | P _{diss} | 150 | mW |
| COUPLER | | | | |
| Isolation test voltage between emitter and detector | t = 1 s | V _{ISO} | 5300 | V _{RMS} |
| Creepage distance | | | ≥ 7 | mm |
| Clearance distance | | | ≥ 7 | mm |
| Isolation thickness between emitter and detector | | | ≥ 0.4 | mm |
| Comparative tracking index per DIN IEC 112/VDE 0303, part 1 | | CTI | ≥ 175 | |
| Isolation resistance | V _{IO} = 500 V, T _{amb} = 25 °C | R _{IO} | ≥ 10 ¹² | Ω |
| | V _{IO} = 500 V, T _{amb} = 100 °C | R _{IO} | ≥ 10 ¹¹ | Ω |
| Operation temperature | | T _{amb} | -55 to +100 | °C |
| Storage temperature range | | T _{stg} | -55 to +150 | °C |
| Soldering temperature ⁽¹⁾ | 2 mm from case, ≤ 10 s | T _{slid} | 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.

⁽¹⁾ Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

| ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | | |
|---|-----------------------------------|-----------|--------------------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| INPUT | | | | | | | |
| Forward voltage | I _F = 60 mA | | V _F | | 1.35 | 1.65 | V |
| Reverse current | V _R = 6 V | | I _R | | 0.01 | 10 | μA |
| Capacitance | V _R = 0 V, f = 1 MHz | | C _O | | 13 | | pF |
| OUTPUT | | | | | | | |
| Collector emitter capacitance | V _{CE} = 5 V, f = 1 MHz | | C _{CE} | | 5.2 | | pF |
| Collector emitter leakage current | V _{CE} = 10 V | SFH615A-1 | I _{CEO} | | 2 | 50 | nA |
| | | SFH615A-2 | I _{CEO} | | 2 | 50 | nA |
| | | SFH615A-3 | I _{CEO} | | 5 | 100 | nA |
| | | SFH615A-4 | I _{CEO} | | 5 | 100 | nA |
| COUPLER | | | | | | | |
| Collector emitter saturation voltage | I _F = 10 mA, f = 1 MHz | | V _{CEsat} | | 0.25 | 0.4 | V |
| Coupling capacitance | | | C _C | | 0.4 | | pF |

Note

- 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.



| CURRENT TRANSFER RATIO ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|---|-----------|--------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| I_C/I_F | $I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$ | SFH615A-1 | CTR | 40 | | 80 | % |
| | | SFH615A-2 | CTR | 63 | | 125 | % |
| | | SFH615A-3 | CTR | 100 | | 200 | % |
| | | SFH615A-4 | CTR | 160 | | 320 | % |
| | $I_F = 1\text{ mA}, V_{CE} = 5\text{ V}$ | SFH615A-1 | CTR | 13 | 30 | | % |
| | | SFH615A-2 | CTR | 22 | 45 | | % |
| | | SFH615A-3 | CTR | 34 | 70 | | % |
| | | SFH615A-4 | CTR | 56 | 90 | | % |

| SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|---|---|-----------|-----------|------|------|------|---------------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| NON-SATURATED | | | | | | | |
| Turn-on time | $I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$ | | t_{on} | | 3 | | μs |
| Rise time | $I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$ | | t_r | | 2 | | μs |
| Turn-off time | $I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$ | | t_{off} | | 2.3 | | μs |
| Fall time | $I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$ | | t_f | | 2 | | μs |
| Cut-off frequency | $I_F = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 75\text{ }\Omega$ | | f_{CO} | | 100 | | kHz |
| SATURATED | | | | | | | |
| Turn-on time | $I_F = 20\text{ mA}$ | SFH615A-1 | t_{on} | | 3 | | μs |
| | $I_F = 10\text{ mA}$ | SFH615A-2 | t_{on} | | 4.2 | | μs |
| | | SFH615A-3 | t_{on} | | 4.2 | | μs |
| | $I_F = 5\text{ mA}$ | SFH615A-4 | t_{on} | | 6 | | μs |
| Rise time | $I_F = 20\text{ mA}$ | SFH615A-1 | t_r | | 2 | | μs |
| | $I_F = 10\text{ mA}$ | SFH615A-2 | t_r | | 3 | | μs |
| | | SFH615A-3 | t_r | | 3 | | μs |
| | $I_F = 5\text{ mA}$ | SFH615A-4 | t_r | | 4 | | μs |
| Turn-off time | $I_F = 20\text{ mA}$ | SFH615A-1 | t_{off} | | 18 | | μs |
| | $I_F = 10\text{ mA}$ | SFH615A-2 | t_{off} | | 23 | | μs |
| | | SFH615A-3 | t_{off} | | 23 | | μs |
| | $I_F = 5\text{ mA}$ | SFH615A-4 | t_{off} | | 25 | | μs |
| Fall time | $I_F = 20\text{ mA}$ | SFH615A-1 | t_f | | 11 | | μs |
| | $I_F = 10\text{ mA}$ | SFH615A-2 | t_f | | 14 | | μs |
| | | SFH615A-3 | t_f | | 14 | | μs |
| | $I_F = 5\text{ mA}$ | SFH615A-4 | t_f | | 15 | | μs |



95 10804-3

Fig. 1 - Test Circuit, Non-Saturated Operation

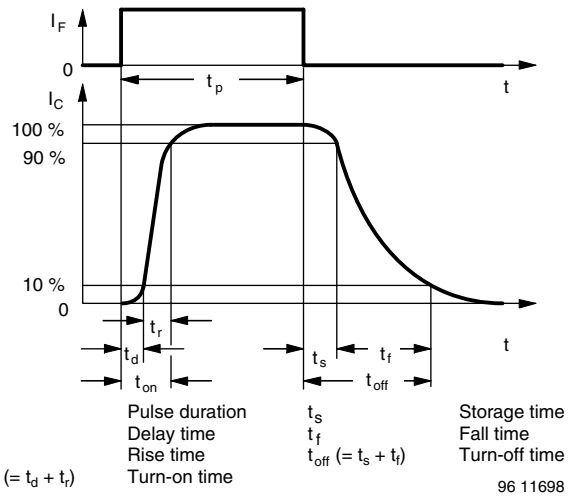
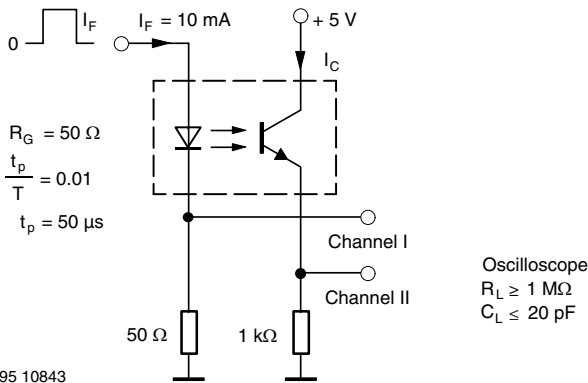


Fig. 3 - Switching Times



95 10843

Fig. 2 - Test Circuit, Saturated Operation

| 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 | |
| Rated impulse voltage | | V_{IOTM} | | | 8 | kV |
| Maximum working voltages | Recurring peak voltage | V_{IORM} | | | 890 | V |
| Forward current | | I_{SI} | | | 275 | mA |
| Power dissipation | | P_{SO} | | | 400 | mW |
| Safety temperature | | T_{SI} | | | 175 | °C |
| Creepage distance | | | 7.0 | | | mm |
| Clearance distance | | | 7.0 | | | mm |
| Isolation distance | per IEC 60950 2.10.5.1 | | 0.4 | | | mm |

Note

- According to DIN EN 60747-5-5 (VDE 0884-5). These optocouplers are 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)

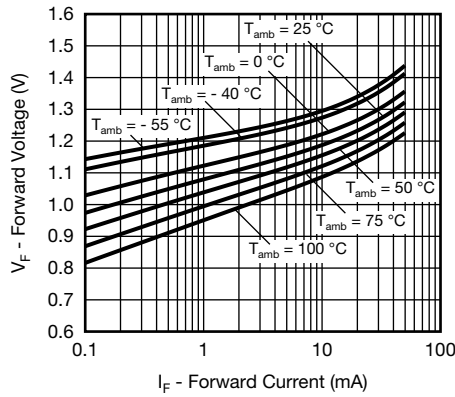


Fig. 4 - Forward Voltage vs. Forward Current

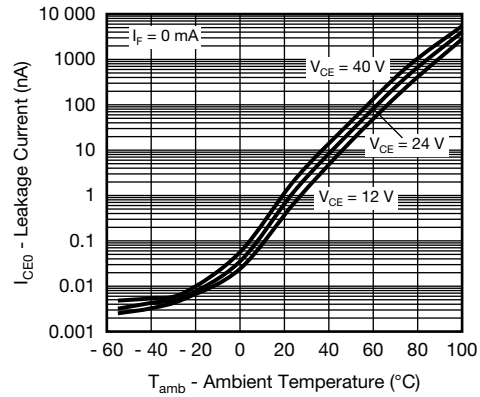


Fig. 7 - Leakage Current vs. Ambient Temperature

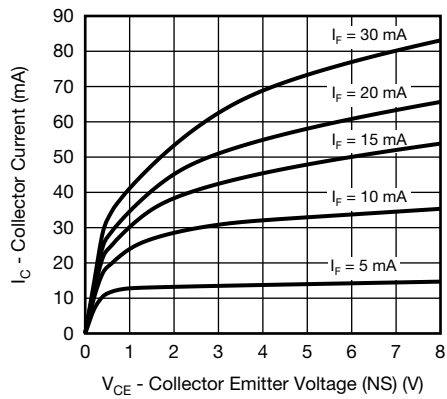


Fig. 5 - Collector Current vs. Collector Emitter Voltage (NS)

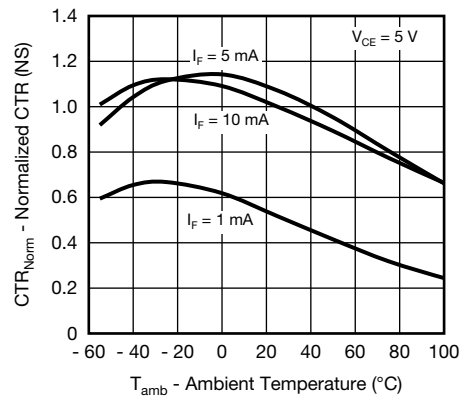


Fig. 8 - Normalized CTR (NS) vs. Ambient Temperature

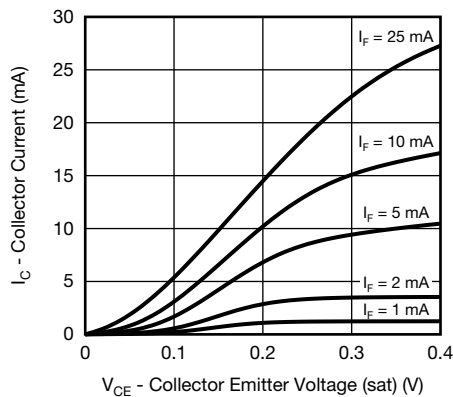


Fig. 6 - Collector Current vs. Collector Emitter Voltage (sat)

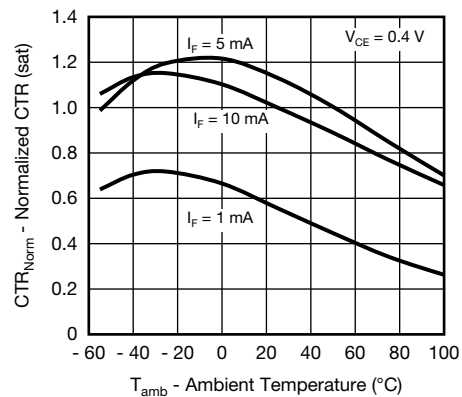


Fig. 9 - Normalized CTR (sat) vs. Ambient Temperature

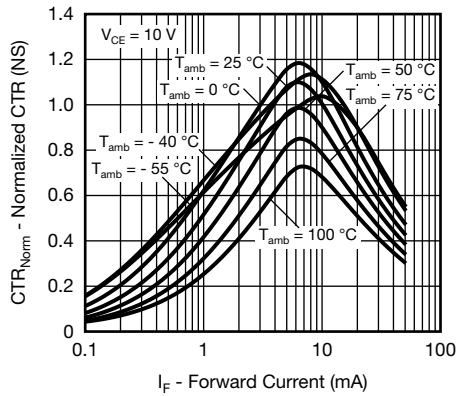


Fig. 10 - Normalized CTR (NS) vs. Forward Current

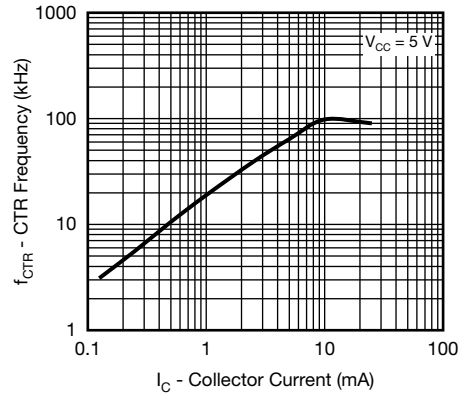


Fig. 13 - CTR Frequency vs. Collector Current

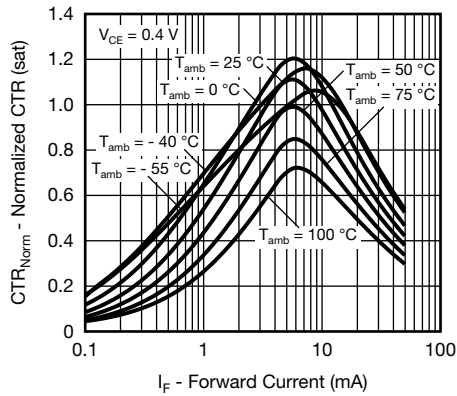


Fig. 11 - Normalized CTR (sat) vs. Forward Current



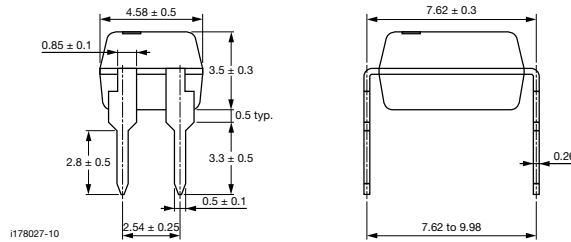
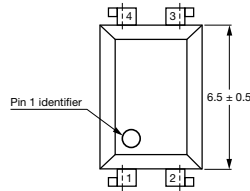
Fig. 14 - Switching Time vs. Load Resistance



Fig. 12 - CTR Frequency vs. Phase Angle



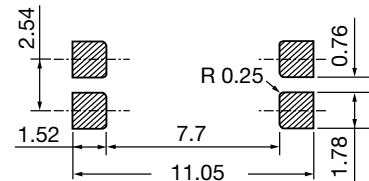
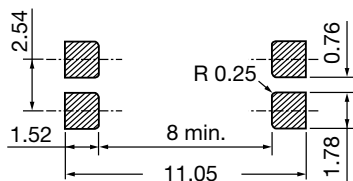
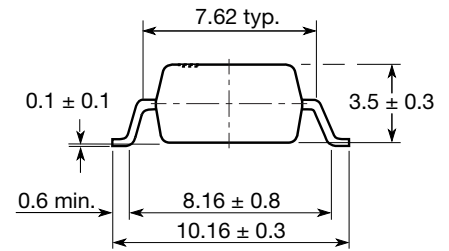
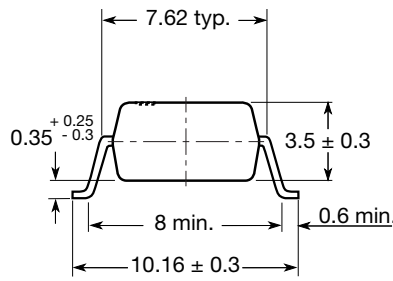
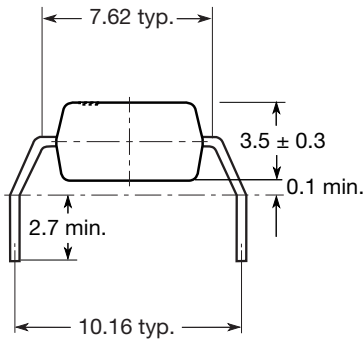
PACKAGE DIMENSIONS in millimeters



Option 6

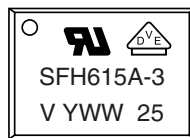
Option 7

Option 9



20802-28

PACKAGE MARKING (Example)



Notes

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

PACKING INFORMATION

| DEVICE PER TUBE | | | |
|-----------------|------------|-----------|-----------|
| TYPE | UNITS/TUBE | TUBES/BOX | UNITS/BOX |
| DIP-4 | 100 | 40 | 4000 |

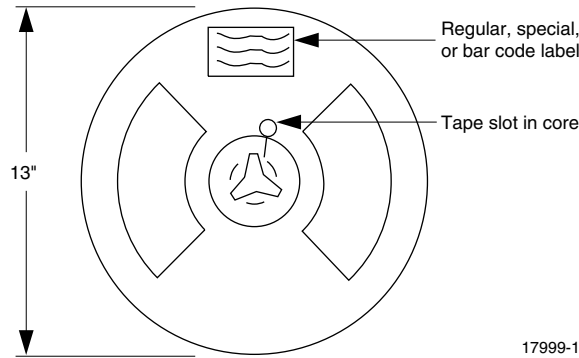


Fig. 15 - Tape and Reel Shipping Medium

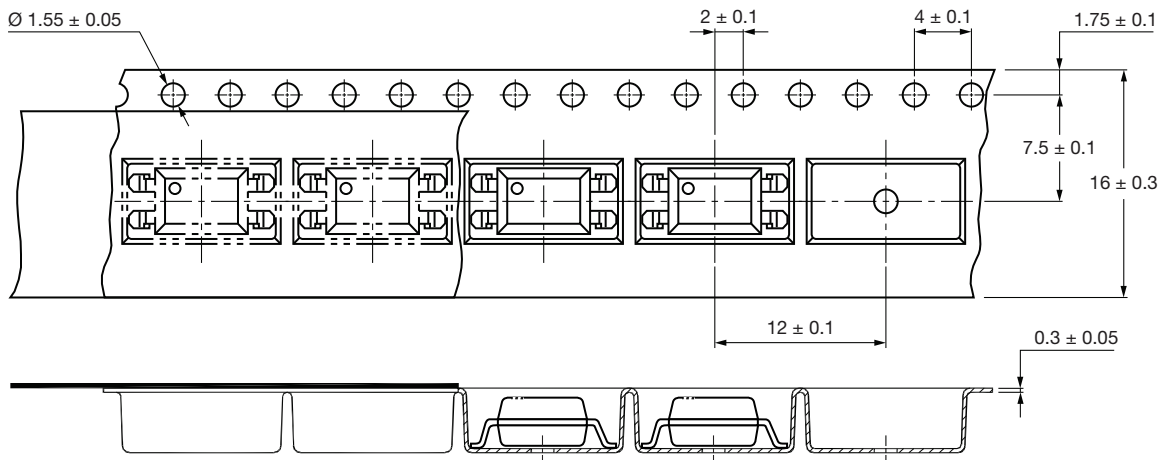


Fig. 16 - Tape and Packing for Option 7 and Option 9

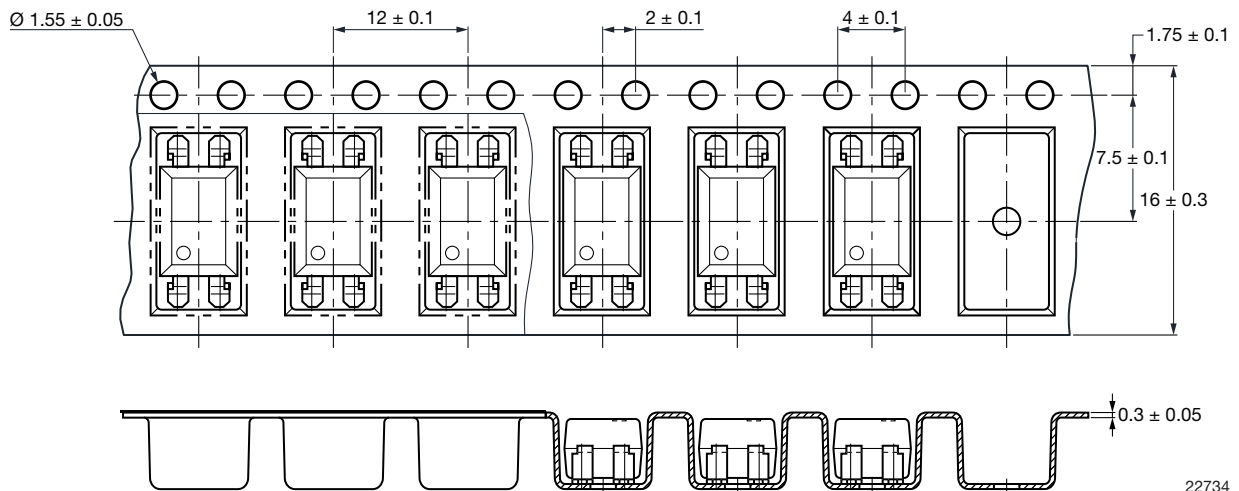


Fig. 17 - Tape Packing for Option 7 and Option 9, T3 Rotation (2000 units per reel)



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