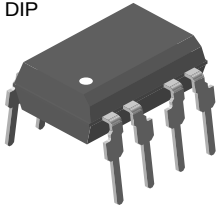


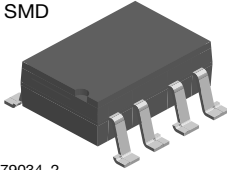


Telecom Switch 1 Form A Solid-State Relay

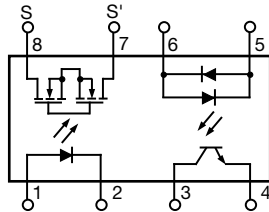
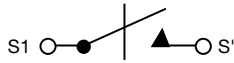
DIP



SMD



i179034_2



FEATURES

- Solid-state relay and optocoupler in one package
- Surface-mount package
- I/O isolation, 5300 V_{RMS}
- LH1529A, CTR min. = 33 %
- LH1529B, CTR min. = 100 %
- Optocoupler
 - Bidirectional current detection
- Solid-state relay (equivalent to TS117P)
 - Typical R_{ON} 20 Ω
 - Load voltage 350 V
 - Load current 120 mA
 - Current limit protection
 - High surge capability
 - Clean bounce free switching
 - Low power consumption
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS COMPLIANT

DESCRIPTION

The LH1529A and LH1529B telecom switches consist of an optically coupled solid state relay (SSR) and bidirectional input optocoupler. The SSR is ideal for performing switch hook and dial-pulse switching whilst optocoupler performs ring detection and loop current sensing functions. Both the SSR and optocoupler have an isolation test voltage of 5300 V_{RMS}.

AGENCY APPROVALS

- UL1577 (pending)
- BSI / BABT (pending)
- FIMKO (pending)

APPLICATIONS

- General telecom switching
 - On/off hook control
 - Dial pulse
 - Ring current detection
 - Loop current sensing

Note

- See "solid-state relays" (application note 56)

| ORDERING INFORMATION | | | | | | | | | | | | |
|----------------------|---|---|---|---|---|-------------------|---|---|-----------------|---|---------------|---------|
| L | H | 1 | 5 | 2 | 9 | # | # | # | T | R | DIP | SMD |
| PART NUMBER | | | | | | ELECTR. VARIATION | | | PACKAGE CONFIG. | | TAPE AND REEL | |
| PACKAGE | | | | | | | | | | | | |
| SMD-8, tubes | | | | | | | | | | | LH1529AAC | |
| SMD-8, tape and reel | | | | | | | | | | | LH1529AACTR | |
| SMD-8, tubes | | | | | | | | | | | LH1529BAC | |
| SMD-8, tape and reel | | | | | | | | | | | LH1529BACTR | |
| DIP-8, tubes | | | | | | | | | | | LH1529BB | |



| ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified) | | | | |
|---|--|-------------------|--------------------|------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| SSR | | | | |
| INPUT | | | | |
| LED continuous forward current | | I _F | 50 | mA |
| LED reverse voltage | I _R ≤ 10 μA | V _R | 5 | V |
| OUTPUT | | | | |
| DC or peak AC load voltage | I _L ≤ 50 μA | V _L | 350 | V |
| Continuous DC load current | | I _L | 120 | mA |
| SSR | | | | |
| Total power dissipation | | P _{diss} | 600 | mW |
| Ambient temperature range | | T _{amb} | -40 to +85 | °C |
| Storage temperature range | | T _{stg} | -40 to +150 | °C |
| Soldering temperature ⁽¹⁾ | t = 10 s max. | T _{sld} | 260 | °C |
| Isolation test voltage (for 60 s) | | V _{ISO} | 5300 | V _{RMS} |
| 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 |
| OPTOCOUPLER | | | | |
| INPUT | | | | |
| LED continuous forward current | | I _F | 50 | mA |
| LED reverse voltage | I _R ≤ 10 μA | V _R | 5 | V |
| OUTPUT | | | | |
| Collector emitter breakdown voltage | | BV _{CEO} | 30 | V |
| Phototransistor power dissipation | | P _{diss} | 150 | mW |

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 |
| SSR | | | | | | | |
| INPUT | | | | | | | |
| LED forward current switch turn-on | I _L = 100 mA, t = 10 ms | | I _{Fon} | - | 0.7 | 2 | mA |
| LED forward current switch turn-off | V _L = ± 300 V | | I _{Foff} | 0.2 | 0.6 | - | mA |
| LED forward voltage | I _F = 10 mA | | V _F | 1.15 | 1.26 | 1.45 | V |
| OUTPUT | | | | | | | |
| On-resistance AC/DC, pins 4 (±) to 6 (±) | I _F = 5 mA, I _L = ± 50 mA | | R _{ON} | 12 | 20 | 25 | Ω |
| Current limit | I _F = 5 mA, t = 5 ms, V _L = ± 6 V | LH1529AAC, LH1529AACTR | I _{limit} | 230 | 260 | 370 | mA |
| | | LH1529BB | I _{limit} | 170 | 210 | 250 | mA |
| | | LH1529BAC, LH1529BACTR | I _{limit} | 170 | 210 | 250 | mA |
| Off-state leakage current | I _F = 0 mA, V _L = ± 100 V | | I _O | - | 0.02 | 200 | nA |
| | I _F = 0 mA, V _L = ± 350 V | | I _O | - | - | 1 | μA |
| Output capacitance pin 7 to pin 8 | I _F = 0 mA, V _L = 1 V | | C _O | - | 55 | - | pF |
| | I _F = 0 mA, V _L = 50 V | | C _O | - | 10 | - | pF |
| Capacitance (input to output) | V _{ISO} = 1 V | | C _{IO} | - | 1.3 | - | pF |



| ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|--|--|---------------------------|-------------|------|------|------|---------------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| OPTOCOUPLER | | | | | | | |
| LED forward current | $I_F = 10\text{ mA}$ | | V_F | 0.9 | 1.2 | 1.5 | V |
| Saturation voltage | $I_F = 16\text{ mA}$, $I_C = 2\text{ mA}$ | | V_{CEsat} | - | 0.7 | 0.5 | V |
| Collector emitter dark current | $I_F = 0\text{ mA}$, $V_{CE} = 5\text{ V}$ | | I_{CEO} | - | - | 500 | nA |
| Trickle current leakage | $I_F = 5\text{ }\mu\text{A}$, $V_{CE} = 5\text{ V}$ | | I_{CEO} | - | - | 1 | μA |
| DC current transfer ratio | $I_F = 6\text{ mA}$, $V_{CE} = 0.5\text{ V}$ | LH1529AAC, LH1529AACTR | CTR_{DC} | 33 | 100 | - | % |
| | | LH1529BB | CTR_{DC} | 100 | 165 | - | % |
| | | LH1529BAC, LH1529BACTR | CTR_{DC} | 100 | 165 | - | % |

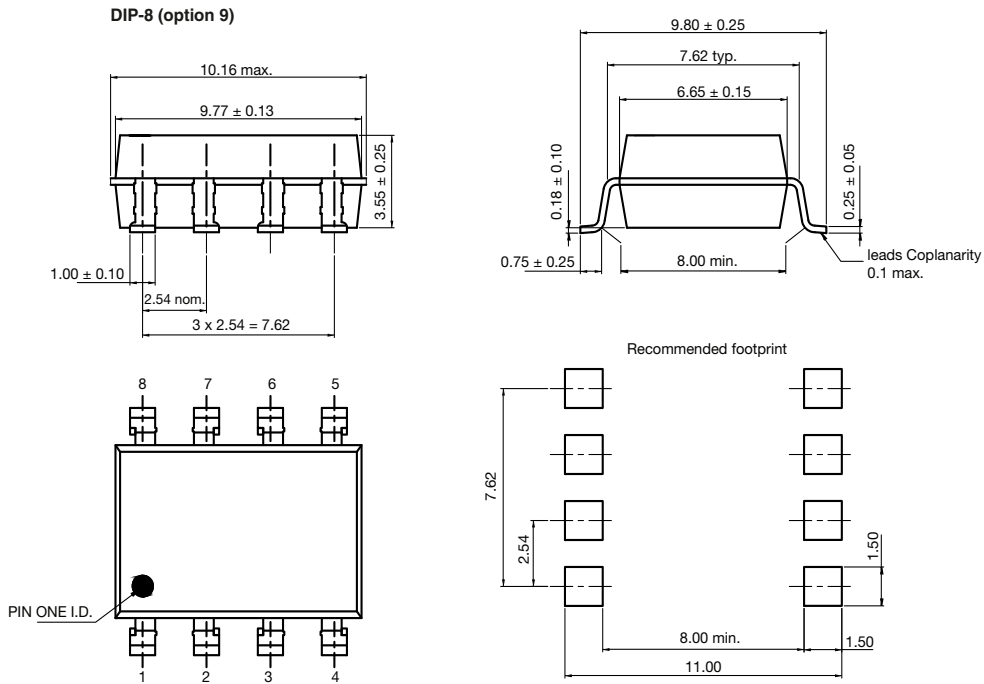
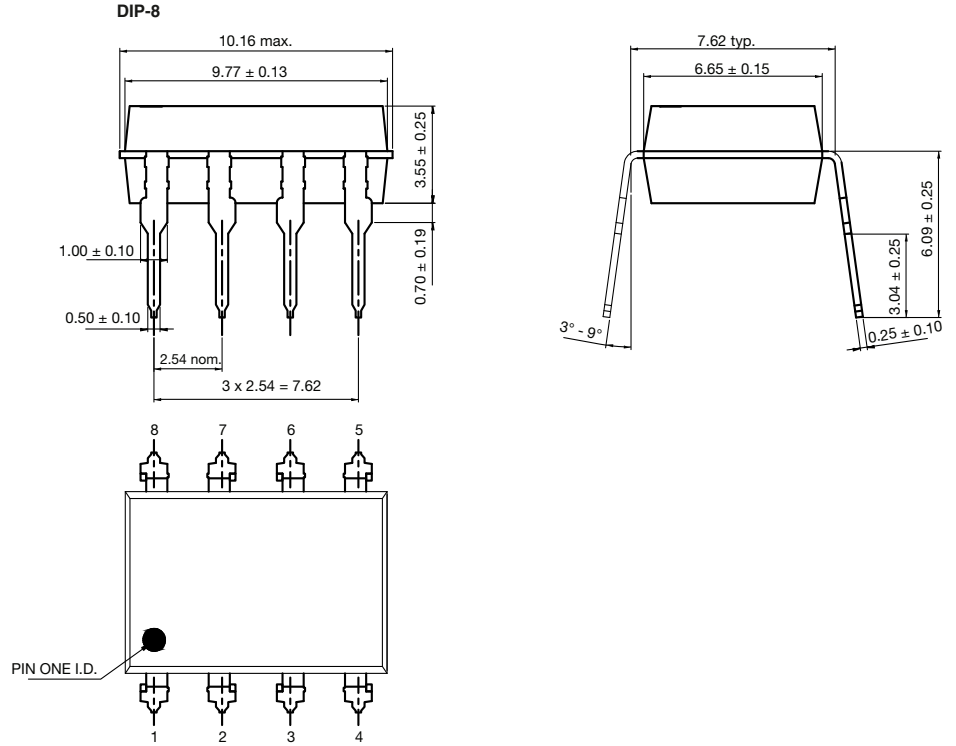
Note

- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluations. Typical values are for information only and are not part of the testing requirements

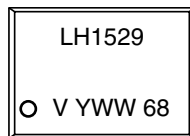
| SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|---|--|---------------------------|-----------|------|------|------|------|
| PARAMETER | TEST CONDITION | PART | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Turn-on time | $I_F = 5\text{ mA}$, $I_L = 50\text{ mA}$ | LH1529AAC, LH1529AACTR | t_{on} | - | 2 | 3 | ms |
| | | LH1529BB | t_{on} | - | 1.3 | 2.5 | ms |
| | | LH1529BAC, LH1529BACTR | t_{on} | - | 1.3 | 2.5 | ms |
| Turn-off time | $I_F = 5\text{ mA}$, $I_L = 50\text{ mA}$ | LH1529AAC, LH1529AACTR | t_{off} | - | 0.6 | 3 | ms |
| | | LH1529BB | t_{off} | - | 0.6 | 2.5 | ms |
| | | LH1529BAC, LH1529BACTR | t_{off} | - | 0.6 | 2.5 | ms |



PACKAGE DIMENSIONS in millimeters



PACKAGE MARKING (example)



Note

- Tape and reel suffix (TR) is not part of the package marking



Footprint and Schematic Information for LH1529

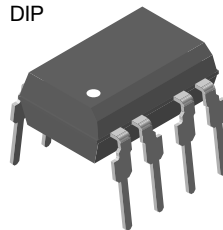
The footprint and schematic symbols for the following parts can be accessed using the associated links. They are available in Eagle, Altium, KiCad, OrCAD / Allegro, Pulsonix, and PADS.

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

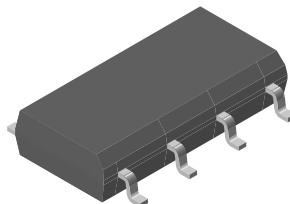
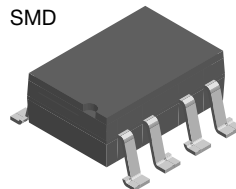
| PART NUMBER | FOOTPRINT / SCHEMATIC |
|-------------|--|
| LH1529AAC | www.snapeda.com/parts/LH1529AAC/Vishay/view-part |
| LH1529AACTR | www.snapeda.com/parts/LH1529AACTR/Vishay/view-part |
| LH1529BAC | www.snapeda.com/parts/LH1529BAC/Vishay/view-part |
| LH1529BACTR | www.snapeda.com/parts/LH1529BACTR/Vishay/view-part |
| LH1529BB | www.snapeda.com/parts/LH1529BB/Vishay/view-part |
| LH1529FPTR | www.snapeda.com/parts/LH1529FPTR/Vishay/view-part |
| LH1529GP | www.snapeda.com/parts/LH1529GP/Vishay/view-part |
| LH1529GPTR | www.snapeda.com/parts/LH1529GPTR/Vishay/view-part |

For technical issues and product support, please contact optocoupleranswers@vishay.com.

DIP



SMD





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