LH1529AB/AAC/AACTR
LH1529BB/BAC/BACTR

Telecom Switch – 1 Form A
Solid State Relay

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%**
- **Flammability; UL94,VØ**
- **Optocoupler**
  - **Bidirectional Current Detection**
- **Solid-state Relay**
  - **See LH1540 Data Sheet**
  - **Typical R_{ON} 20 Ω**
  - **Load Voltage 350 V**
  - **Load Current 120 mA**
  - **Current Limit Protection**

AGENCY APPROVALS

- **UL – File No. E52744**
- **BSI/BABT Cert. No. 7980**
- **FIMKO Approval**

APPLICATIONS

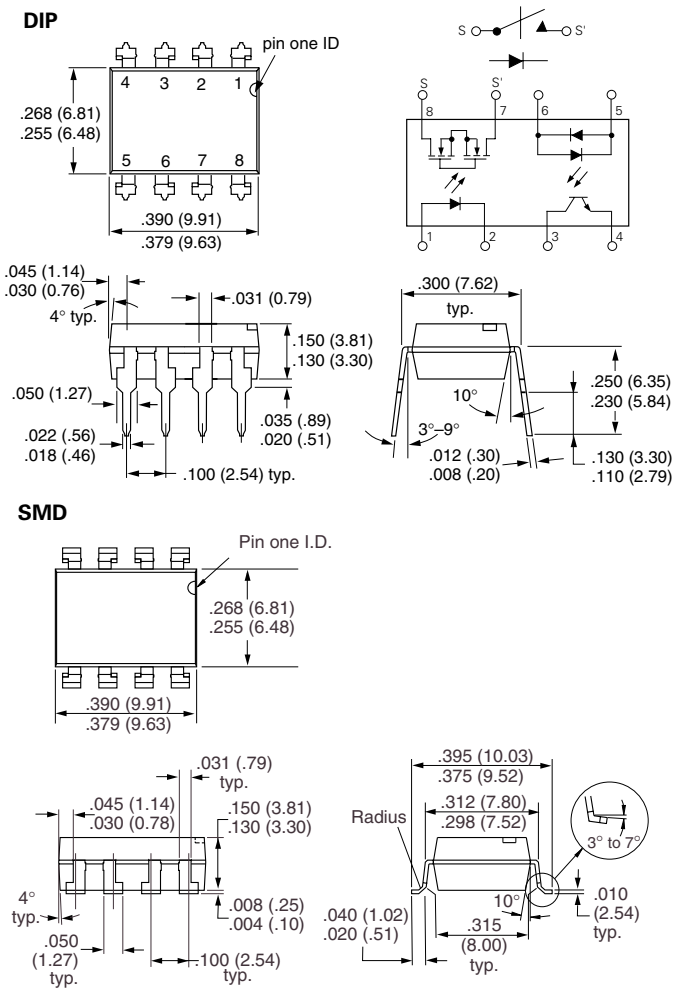
- **General Telecom Switching**
  - **On/off Hook Control**
  - **Dial Pulse**
  - **Ring Current Detection**
  - **Loop Current Sensing**
- **See Appnote 56**

DESCRIPTION

The LH1529A and LH1529B Telecom switches consist of an optically coupled solid state relay (SSR) and a bidirectional input optocoupler. The SSR is ideal for performing switchhook and dial-pulse switching while the optocoupler performs ring detection and loop current sensing functions. Both the SSR and optocoupler provide 5300 V_{RMS} of input to output isolation.

The SSR is integrated on a monolithic receptor die using high voltage technology. The optocoupler provides bidirectional current sensing via two antiparallel GaAs infrared emitting diodes. The opto channel provides a minimum CTR of 33% at 6.0 mA.

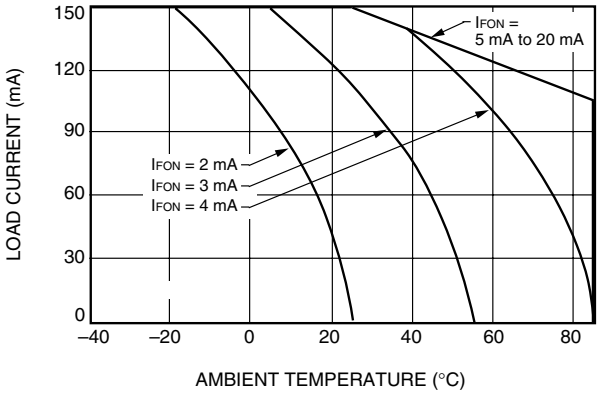
Package Dimensions in Inches (mm)



Part Identification

Part Number		Description
LH1529AB	LH1529BB	8 pin DIP, Tubes
LH1529AAC	LH1529BAC	8-pin SMD, Tubes
LH1529AACTR	LH1529BACTR	8-pin SMD, Tape and Reel

Recommended Operating Conditions



Absolute Maximum Ratings, T_A=25°C (except where noted)

Stresses in excess of the absolute Maximum Ratings can cause permanent damage to the device. These are absolute stress ratings only. 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 time can adversely affect reliability.

Package

Ambient Temperature Range, T_A ..... –40 to +85°C
Storage Temperature Range, T_{stg} ..... –40 to +150°C
Soldering Temperature (t=10 s max.) ..... 260°C
Isolation Test Voltage (for 1.0 s) ..... 5300 V_{RMS}
Isolation Resistance
V_{IO}=500 V, T_A=25°C ..... $\geq 10^{12}$ Ω
V_{IO}=500 V, T_A=100°C ..... $\geq 10^{11}$ Ω

SSR

LED Continuous Forward Current, I_F ..... 50 mA
LED Reverse Voltage ($V_R \leq 10$ μA) ..... 5.0 V
DC or Peak AC Load Voltage ($V_L \leq 50$ μA) ..... 350 V
Continuous DC Load Current ..... 120 mA
Total Power Dissipation, P_{tot} ..... 600 mW

Optocoupler

LED Continuous Forward Current, I_F ..... 50 mA
LED Reverse Voltage ($V_R \leq 10$ μA) ..... 5.0 V
Collector to Emitter Breakdown Voltage, BV_{CEO} ..... 30 V
Phototransistor Power Dissipation, P_{tot} ..... 150 mW

Electrical Characteristics, T_A=25°C

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Condition
SSR							
LED Forward Current for Switch Turn-on		I_{Fon}	—	0.7	2.0	mA	I_L=100 mA, t=10 ms
LED Forward Current for Switch Turn-off		I_{Foff}	0.2	0.6	—	mA	V_L=±300 V
LED Forward Voltage		V_F	1.15	1.26	1.45	V	I_F=10 mA
ON-Resistance, AC/DC, Pins 4 (±) to 6 (±)		R_{ON}	12	20	25	Ω	I_F=5.0 mA, I_L=±50 mA
Current Limit	LH1529A	I_{limit}	230	260	370	mA	I_F=5.0 mA, t=5.0 ms, V_L=±6.0 V
	LH1529B		170	210	250		
Off-state Leakage Current		—	—	0.02	200	nA	I_F=0 mA, V_L=±100 V
				—	1.0	μA	I_F=0 mA, V_L=±350 V
Output Capacitance Pin 7 to Pin 8		—	—	55	—	pF	I_F=0 mA, V_L=1 V
		—	—	10	—		I_F=0 mA, V_L=50 V
Input/Output Capacitance		C_{ISO}	—	1.3	—	pF	V_{ISO}=1.0 V
Turn-on Time	LH1529A	t_{on}	—	2.0	3.0	ms	I_F=5.0 mA, I_L=50 mA
	LH1529B			1.3	2.5		
Turn-off Time	LH1529A	t_{off}	—	0.6	3.0	ms	I_F=5.0 mA, I_L=50 mA
	LH1529B			0.6	2.5		
Optocoupler							
LED Forward Voltage		V_F	0.9	1.2	1.5	V	I_F=10 mA
Saturation Voltage		V_{CEsat}	—	0.7	0.5	V	I_F=16 mA, I_C=2.0 mA
Dark Current Leakage		I_{CEO}	—	—	500	nA	I_F=0 mA, V_{CE}=5.0 V
Trickle Current Leakage		I_{CEO}	—	—	1.0	μA	I_F=5.0 μA, V_{CE}=5.0 V
DC Current Transfer Ratio	LH1529A	CTR	33	100	—	%	I_F=6.0 mA, V_{CE}=0.5 V
	LH1529B		100	165			

Typical Performance Characteristics

Figure 1. LED Voltage vs. Temperature

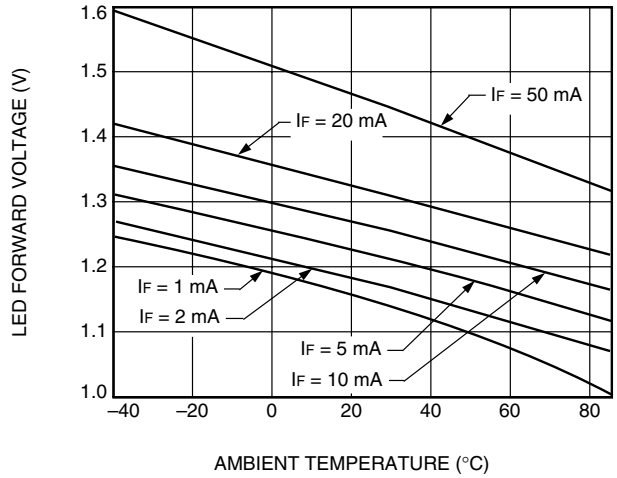


Figure 2. Current Limit vs. Temperature

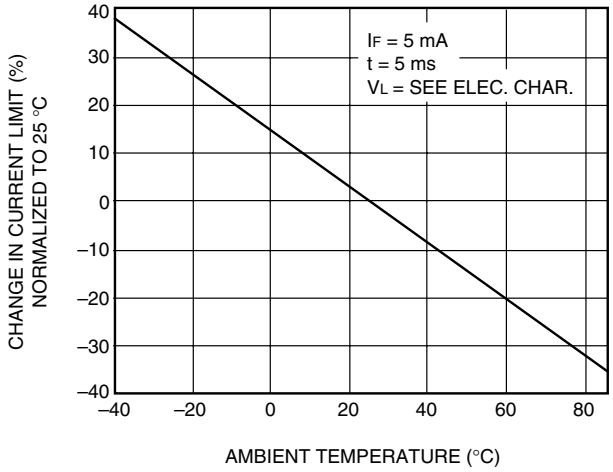


Figure 3. Switch Capacitance vs. Applied Voltage

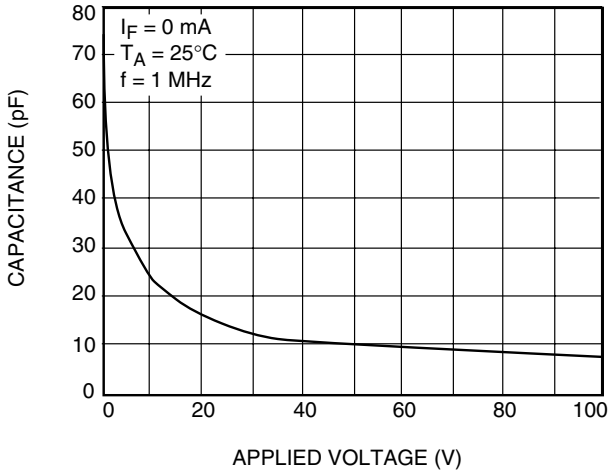


Figure 4. LED Current for Switch Turn-off vs. Temperature

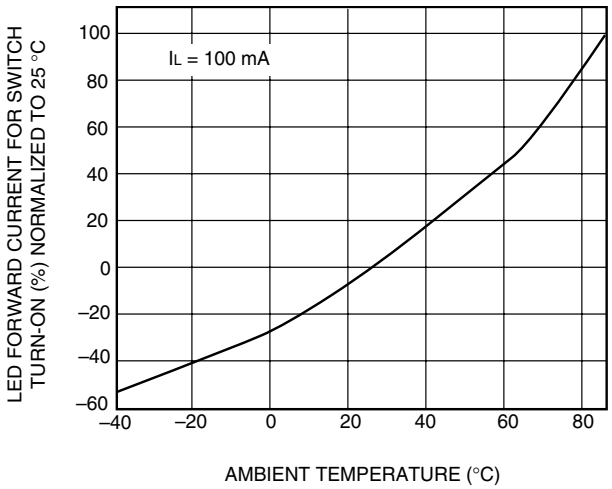


Figure 5. ON-Resistance vs. Temperature

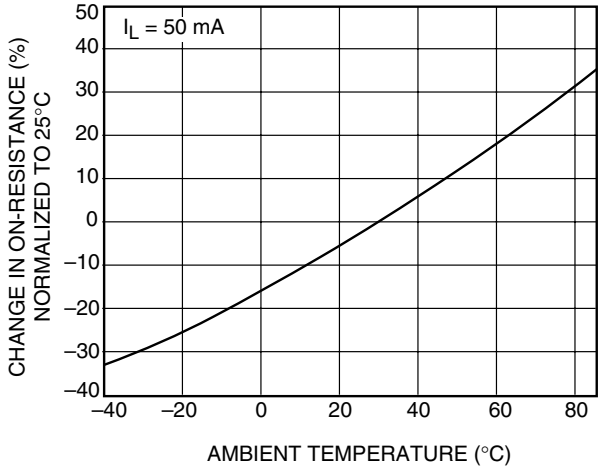


Figure 6. Insertion Loss vs. Frequency

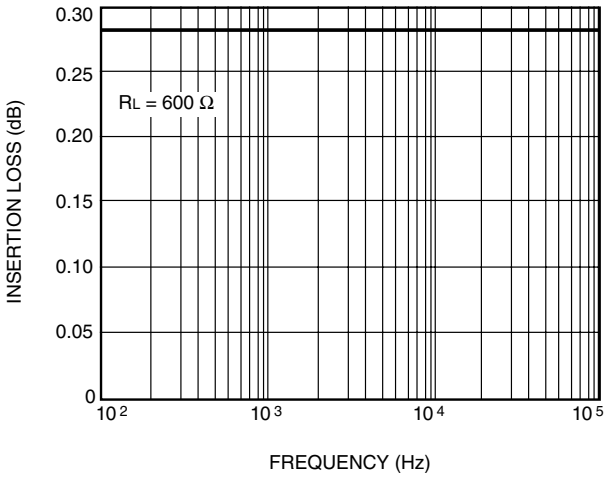


Figure 7. Leakage Current vs. Applied Voltage at Elevated Temperatures

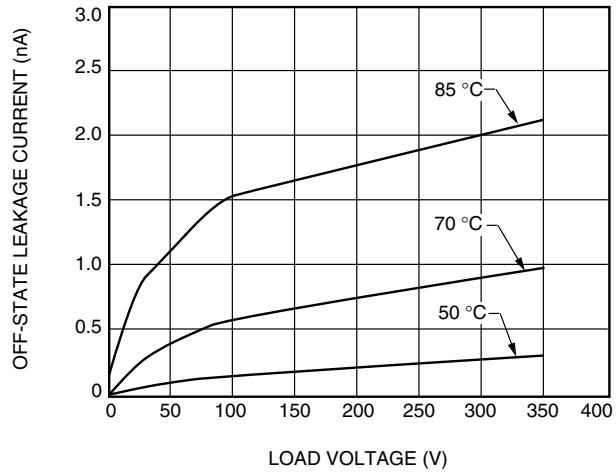


Figure 8. Output Isolation

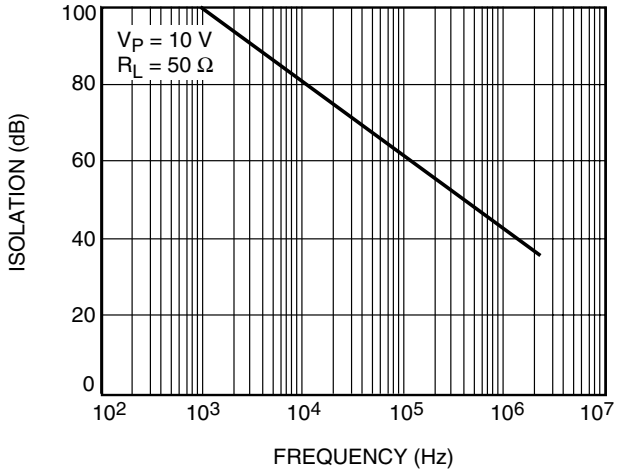


Figure 9. Switch Breakdown Voltage vs. Temperature

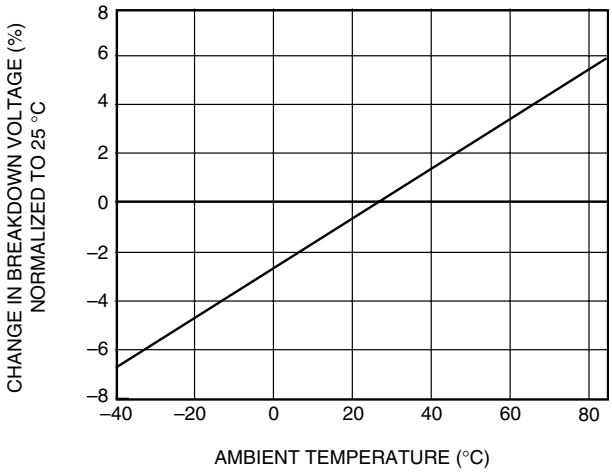


Figure 10. Leakage Current vs. Applied Voltage