FEATURES

- **Current Limit Protection**
- **I/O Isolation, 5300 V_{RMS}**
- **Typical R_{ON} 20 Ω**
- **Load Voltage 350 V**
- **Load Current 120 mA**
- **High Surge Capability**
- **Linear, AC/DC Operation**
- **Clean Bounce Free Switching**
- **Low Power Consumption**
- **High Reliability Monolithic Receptor**
- **SMT Lead Available on Tape and Reel**

AGENCY APPROVALS

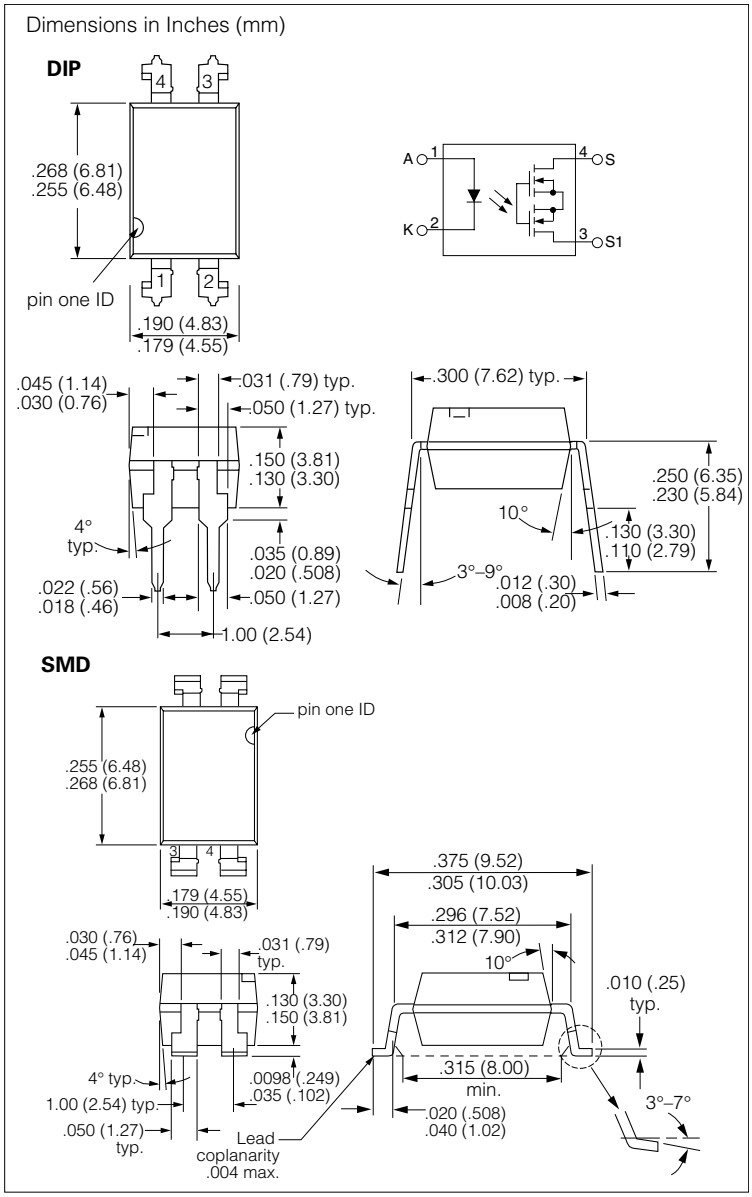
- **UL – File No. E52744**
- **BSI/BABT Cert. No. 7980**

APPLICATIONS

- **General Telecom Switching**
  - **On/off Hook Control**
  - **Ring Delay**
  - **Dial Pulse**
  - **Ground Start**
  - **Ground Fault Protection**
- **Instrumentation**
- **Industrial Controls**
- **See Application Note 56**

DESCRIPTION

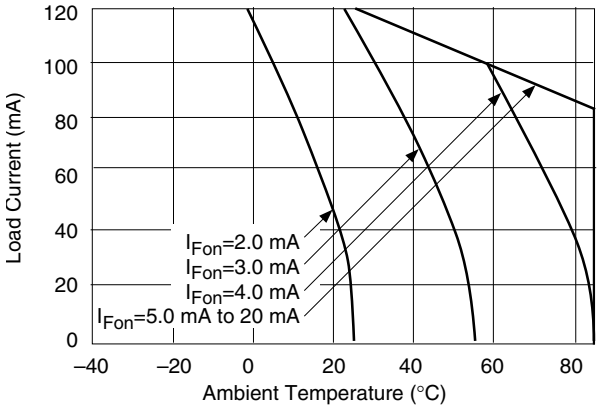
The LH1546AD (4 Pin DIP) is robust, ideal for telecom and ground fault applications. It is a SPST normally open switch (1 Form A) that replaces electromechanical relays in many applications. It is constructed using a GaAs LED for actuation control and an integrated monolithic die for the switch output. The die, fabricated in a high-voltage dielectrically isolated BCDMOS technology, is comprised of a photodiode array, switch control circuitry and MOSFET switches. In addition, it employs current-limiting circuitry which meets FCC 68.302 and other regulatory voltage surge requirements when overvoltage protection is provided.



Part Identification

Part Number	Description
LH1546AD	4-pin DIP, Tubes
LH1546ADF	4-pin SMD, Gullwing, Tubes
LH1546ADFTR	4-pin SMD, Gullwing, Tape and Reel

Recommended Operating Conditions



Absolute Maximum Ratings, T_A=25°C

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 the data sheet. Exposure to maximum rating conditions for extended periods can adversely affect device reliability.

Ambient Temperature Range ..... –40 to +85°C
Storage Temperature Range ..... –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 Output Power Dissipation (continuous) ..... 550 mW
LED Continuous Forward Current ..... 50 mA
LED Reverse Voltage ($I_R \leq 10$ μA) ..... 8.0 V
DC or Peak AC Load Voltage ($I_L \leq 50$ μA) ..... 350 V
Continuous DC Load Current at 25°C
Bidirectional ..... 120 mA

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	Sym.	Min.	Typ.	Max.	Units	Test Conditions
Input						
LED Forward Current, Switch Turn-on	I_{Fon}	—	1.7	3.0	mA	I_L=100 mA, t=10 ms
LED Forward Current, Switch Turn-off	I_{Foff}	0.2	1.6	—	mA	V_L ±300 V
LED Forward Voltage	V_F	1.15	1.20	1.45	V	I_F=10 mA
Output						
ON-resistance, ac/dc: Pin 3 (±) to 4 (±)	R_{ON}	—	20	35	Ω	I_F=5.0 mA, I_L=50 mA
OFF-resistance	R_{OFF}	0.5	5000	—	GΩ	I_F=0 mA, V_L=±100 V
Off-state Leakage Current	I_O	—	0.32	200	nA	I_F=0 mA, V_L=±100 V
Output Capacitance, Pin 3 to 4	C_O	—	55	—	pF	I_F=0 mA, V_L=1.0 V
	—	—	10	—	pF	I_F=0 mA, V_L=50 V
Transfer						
Input/Output Capacitance	C_{ISO}	—	0.5	—	pF	V_{ISO}=1.0 V
Turn-on Time	t_{on}	—	2.0	3.0	ms	I_F=5.0 mA, I_L=50 mA
Turn-off Time	t_{off}	—	0.08	3.0	ms	I_F=5.0 mA, I_L=50 mA

Typical Performance Characteristics

Figure 1. LED Voltage vs. Temperature

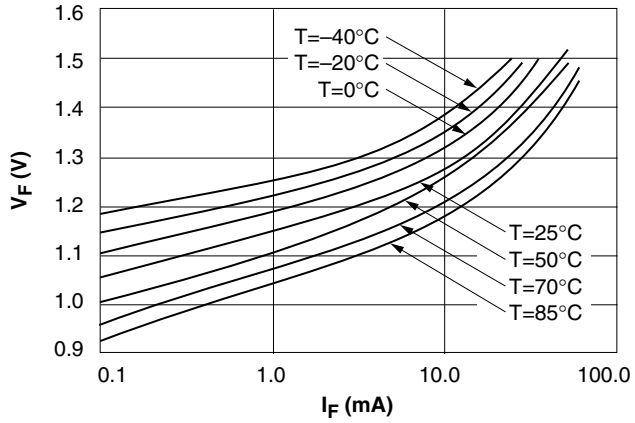


Figure 2. LED Current for Switch Turn-on vs. Temperature

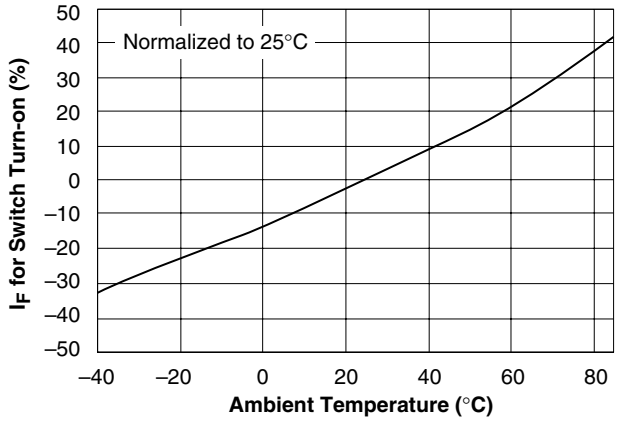


Figure 3. On Resistance vs. Temperature

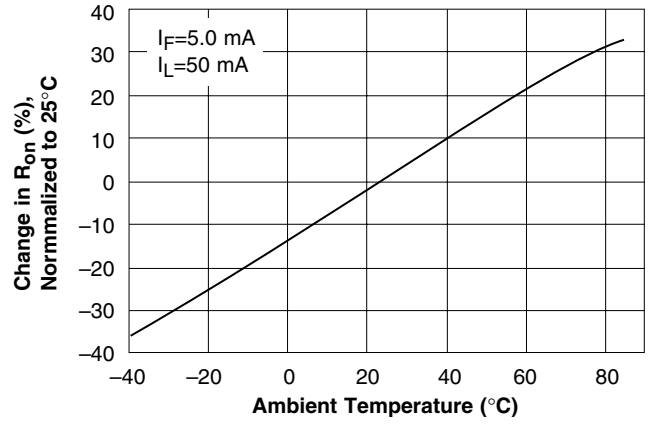


Figure 4. Switch Capacitance vs. Applied Voltage

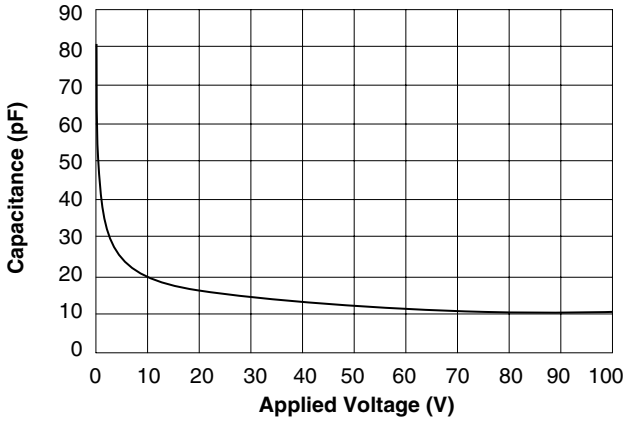


Figure 5. Leakage Current vs. Applied Voltage

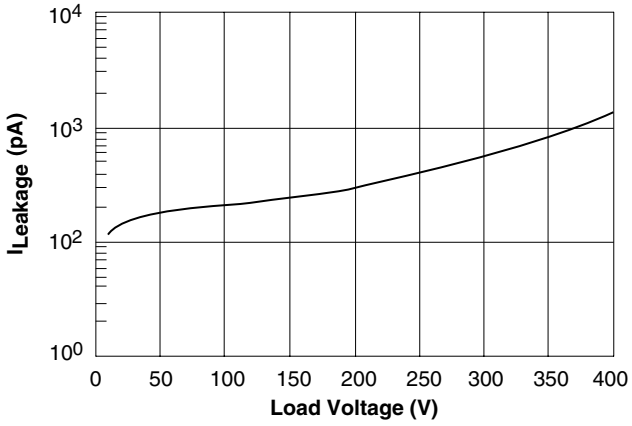


Figure 6. Leakage Current vs. Applied Voltage at Elevated Temperatures

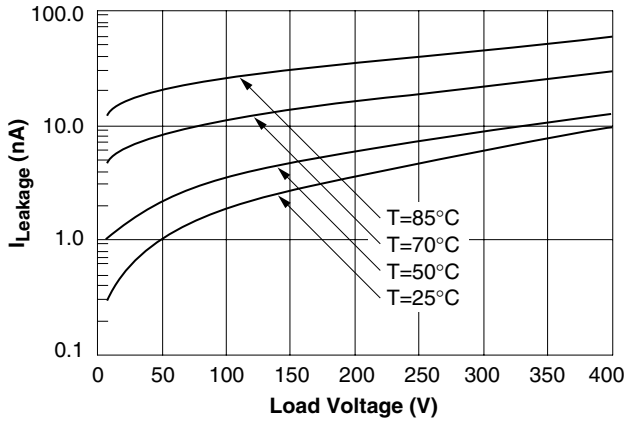


Figure 7. Turn-on Time vs. Temperature

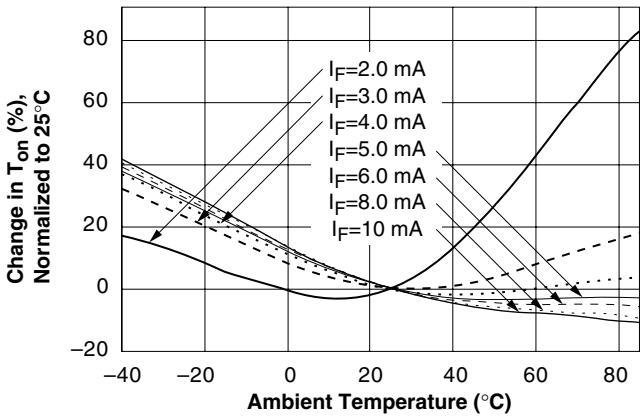


Figure 8. Turn-off vs. Temperature

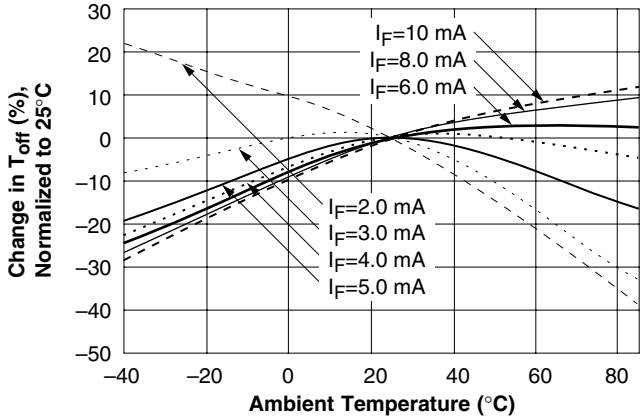


Figure 9. Turn-on vs. LED Current

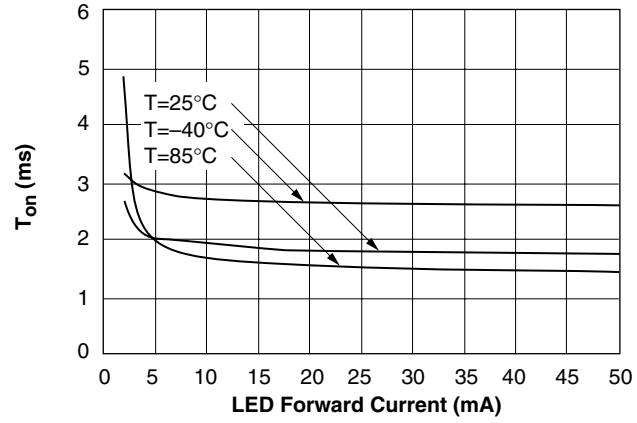


Figure 10. Turn-off vs. LED Current