LH1550AT1/AAB1/AAB1TR

1 Form A
High-Voltage Solid State Relay

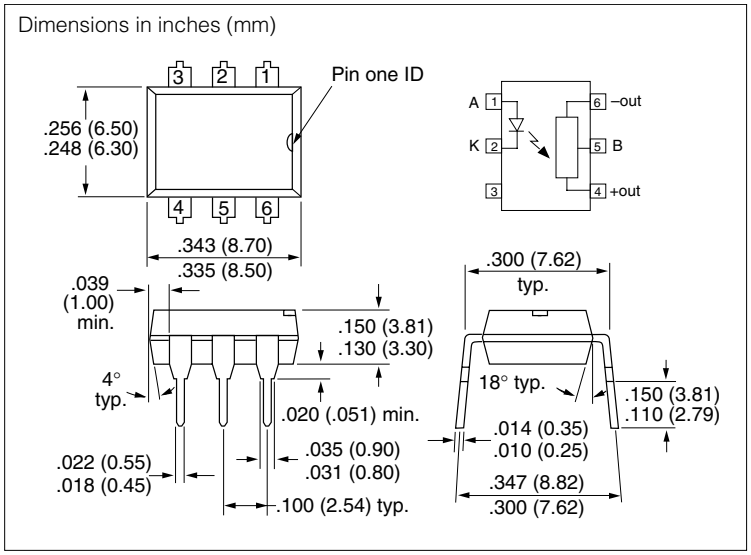
FEATURES
- **Current Limit Protection**
- **I/O Isolation, 3000 V_{RMS}**
- **Typical R_{ON} 20 Ω**
- **Load Voltage 350 V**
- **Load Current 120 mA**
- **High Surge Capability**
- **Linear, AC/DC Operation**
- **Clean Bounce Free Switching**
- **Low Power Consumption**
- **High Reliability Monolithic Receptor**
- **SMD Lead Available on Tape and Reel**
- **Equivalent to CPC1035N**
- **UL 52744 Recognition**
- **BABT/BSI Certified**

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

DESCRIPTION

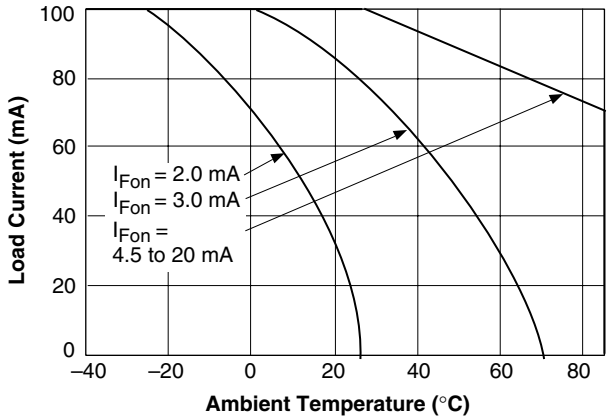
The LH1550 is robust, ideal for telecom and ground fault applications. It is a SPST normally open switch (1 Form A) that replaces electromechanical relays in many applications. It is similar to the LH1540, but has a characteristically higher On resistance. It is constructed using a GaAlAs LED for actuation control and an integrated monolithic die for the switch output. The die, fabricated in a high-voltage dielectrically isolated 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.

Dimensions in inches (mm)



Part Number	Description
LH1550AT1	6-pin DIP, Thru Hole
LH1550AAB1	6-pin SMD
LH1550AAB1TR	6-pin SMD, Tape and Reel

Recommended Operating Conditions



Absolute Maximum Ratings T_A=25°C

Ambient Temperature Range (T_A) ..... –40 to +85°C
Storage Temperature Range (T_{stg}) ..... –40 to +150°C
Pin Soldering Temperature (t=10 s max) (T_S) ..... 260°C
Input/Output Isolation Voltage
(V_{RMS} t=1.0 s, I_{ISO}=10 µA max) (V_{ISO}) ..... 3750 V_{RMS}
LED Continuous Forward Current (I_F) ..... 50 mA
LED Reverse Voltage (I_R≤10 µA) (V_R) ..... 8.0 V
DC or Peak AC Load Voltage (I_L≤50 µA) (V_L) ..... 350 V
Continuous DC Load Current (I_L)
Bidirectional Operation ..... 100 mA
Unidirectional Operation ..... — mA
Peak Load Current (t=100 ms) (single shot) (I_P) ..... †
Output Power Dissipation (continuous) (P_{DISS}) ..... 550 mW

† Refer to Current Limit Performance Application Note 58 for a discussion on relay operation during transient currents.

Note:
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.

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.	Units	Test Conditions
Input						
LED Forward Current, Switch Turn-on	I_{Fon}	—	1.1	2.0	mA	I_L=100 mA, t=10 ms
LED Forward Current, Switch Turn-off	I_{Foff}	0.2	1.0	—	mA	V_L±350 V
LED Forward Voltage	V_F	1.15	1.26	1.45	V	I_F=10 mA
Output						
ON-resistance, ac/dc: Pin 4 (±) to 6 (±)	R_{ON}	—	28	35	Ω	I_F=5.0 mA, I_L=50 mA
ON-resistance, dc: Pin 4, 6 (+) to 5 (-)		—	7.0	10.0	Ω	I_F=5.0 mA, I_L=100 mA
OFF-resistance	R_{OFF}	0.5	300	—	GΩ	I_F=0 mA, V_L=±100 V
Current Limit ac/dc	I_{LMT}	170	210	250	mA	I_F=5.0 mA, t=5.0 ms V_L=6.0 V
Off-state Leakage Current	I_O	—	0.35	200	nA	I_F=0 mA, V_L=±100 V
		—	0.096	1.0	µA	I_F=0 mA, V_L=±350 V
Output Capacitance, Pin 4 to 6	C_O	—	18	—	pF	I_F=0 mA, V_L=1.0 V
		—	6.7	—	pF	I_F=0 mA, V_L=50 V
Switch Offset	V_{OS}	—	0.3	—	µV	I_F=5.0 mA
Transfer						
Input/Output Capacitance	C_{ISO}	—	0.67	—	pF	V_{ISO}=1.0 V
Turn-on Time	t_{on}	—	1.14	3.0	ms	I_F=5.0 mA, I_L=50 mA
Turn-off Time	t_{off}	—	0.71	3.0	ms	I_F=5.0 mA, I_L=50 mA

Figure 1. LED Voltage vs. Temperature

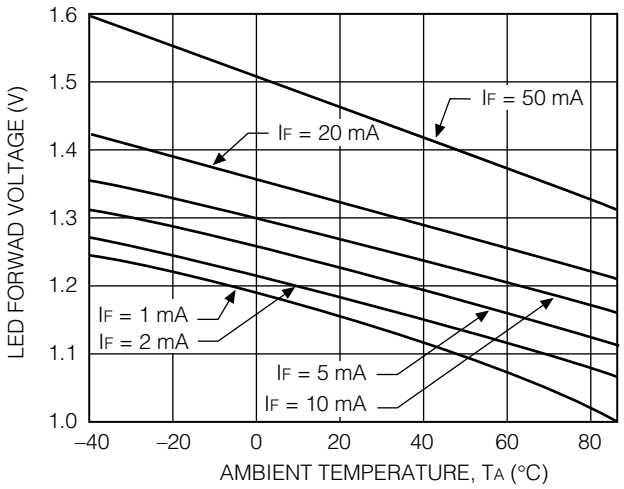


Figure 2. Current Limit vs. Temperature

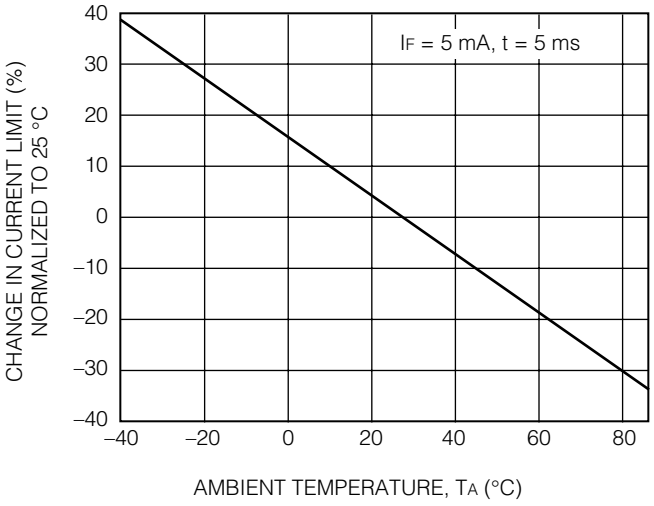


Figure 3. Turn-on Time vs. Temperature

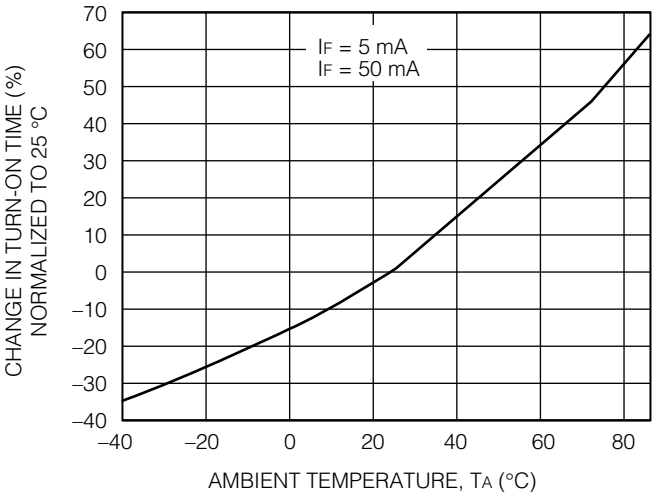


Figure 4. LED Current for Switch Turn-on/off vs. Temperature

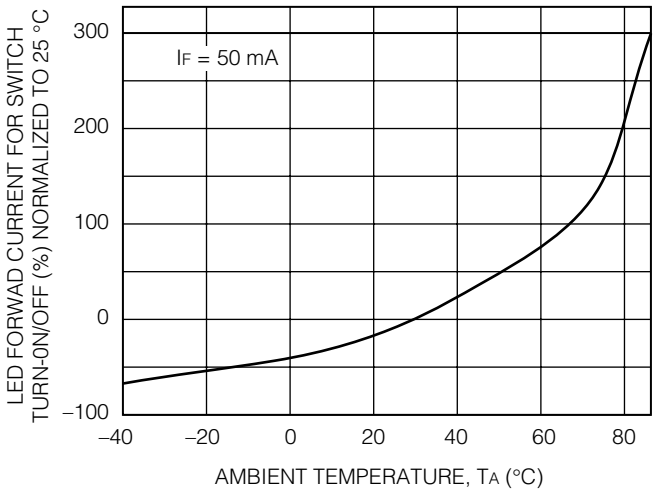


Figure 5. ON-resistance vs. Temperature

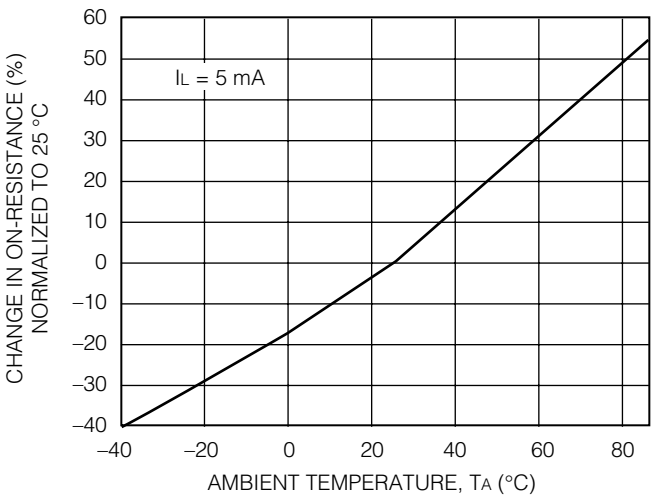


Figure 6. Turn-off Time vs. Temperature