



# LH1547AT1/AAB1/AAB1TR

## 1 Form A Solid-State Relay

### FEATURES

- Load Voltage 400 V
- Load Current 120 mA
- Typical  $R_{ON}$  23  $\Omega$
- I/O Isolation, 5300 V<sub>RMS</sub>
- Current-limit Protection
- Linear dc Operation
- High-surge Capability
- Clean, Bounce-free Switching
- Low Power Consumption
- Surface-mountable
- Flammability; UL94,VØ

### AGENCY APPROVALS

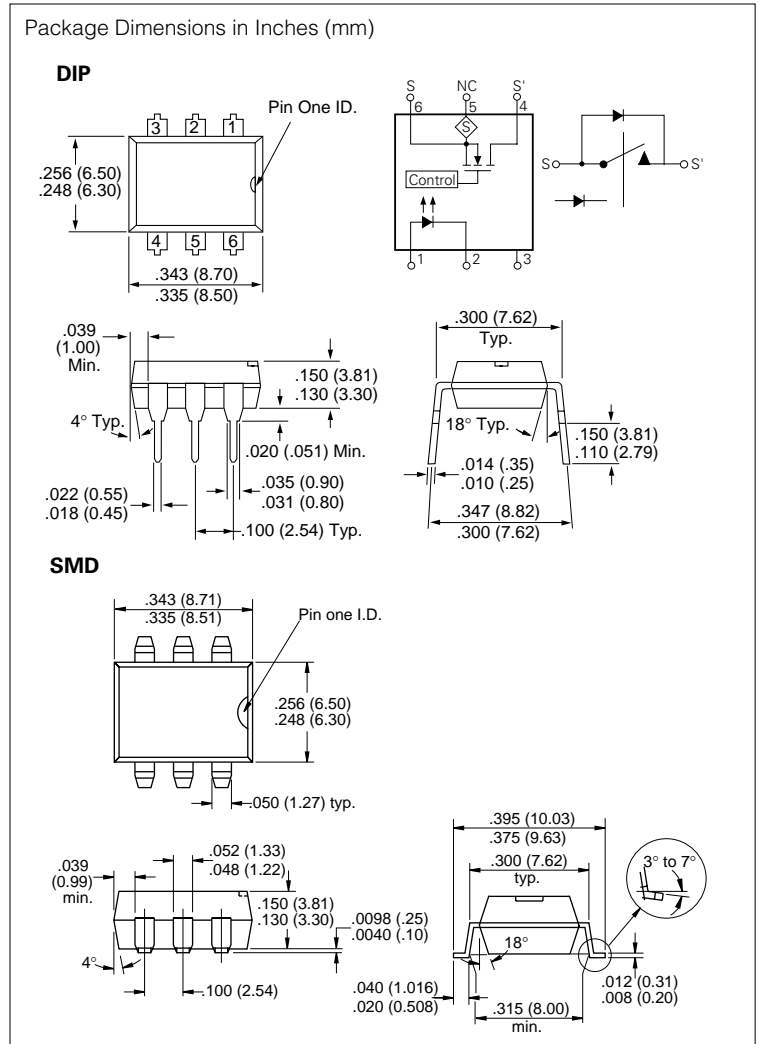
- UL – File No. E52744
- CSA – Certification 093751
- BSI/BABT Cert. No. 7980
- VDE 0884 Approval
- FIMKO Approval

### APPLICATIONS

- General Telecom Switching
- Programmable Controllers
- Industrial Controls
- Instrumentation
- Peripherals

### DESCRIPTION

The LH1547 is a SPST normally open unidirectional relay that can switch dc signals. The relay 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 a DMOS switch.

### Part Identification

Part Number	Description
LH1547AT1	6-pin DIP, Tubes
LH1547AAB1	6-pin SMD, Gullwing, Tubes
LH1547AAB1TR	6-pin SMD, Gullwing, Tape and Reel

## Recommended Operating Conditions

Parameter	Sym.	Min.	Typ.	Max.	Unit
LED Forward Current for Switch Turn-on ( $T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$ )	$I_{Fon}$	5.0	—	20	mA

## Absolute Maximum Ratings, $T_A = 25^\circ\text{C}$ (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.

Ambient Operating Temperature Range,  $T_A$ ..... $-40^\circ$  to  $+85^\circ\text{C}$

Storage Temperature Range,  $T_{stg}$ ..... $-40^\circ$  to  $+150^\circ\text{C}$

Pin Soldering Temperature,  $t = 10$  s max,  $T_S$ .....  $260^\circ\text{C}$

Input/Output Isolation Voltage,  $t = 1.0$  s,  $V_{ISO}$ .....  $5300 V_{RMS}$

LED Input Ratings:

Continuous Forward Current,  $I_F$ .....  $50$  mA

Reverse Voltage,  $V_R$ .....  $10$  V

Output Operation:

dc or Peak ac Load Voltage,  $I_L \leq 50$   $\mu\text{A}$ ,  $V_L$ .....  $400$  V

Continuous dc Load Current,  $I_L$ .....  $120$  mA

Power Dissipation,  $P_{DISS}$ .....  $500$  mW

## Electrical Characteristics, $T_A = 25^\circ\text{C}$

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
LED Forward Current for Switch Turn-on	$I_{Fon}$	—	0.9	2.0	mA	$I_L = 90$ mA, $t = 10$ ms
LED Forward Current for Switch Turn-off	$I_{Foff}$	0.1	0.4	—	mA	$V_L = \pm 350$ V
LED Forward Voltage	$V_F$	1.15	1.22	1.45	V	$I_F = 10$ mA
ON-resistance	$R_{ON}$	12	23	34	$\Omega$	$I_F = 5.0$ mA
OFF-resistance	$R_{OFF}$	—	3300	—	G $\Omega$	$I_F = 0$ mA, $V_L = \pm 100$ V
Current Limit	$I_{LMT}$	150	210	270	mA	$I_F = 5.0$ mA, $t = 5.0$ ms $V_L = 10$ V
Output Off-state Leakage Current	—	—	0.03 —	200 1.0	nA $\mu\text{A}$	$I_F = 0$ mA, $V_L = \pm 100$ V $V_L = \pm 400$ V
Turn-on Time	$t_{on}$	—	1.6	5.0	ms	$I_F = 5.0$ mA, $V_L = 50$ V $R_L = 1.0$ k $\Omega$
Turn-off Time	$t_{off}$	—	2.2	5.0	ms	$I_F = 5.0$ mA, $V_L = 50$ V $R_L = 1.0$ k $\Omega$