SIEMENS

LH1547
1 Form A
dc High-Voltage Solid State Relay

FEATURES

	LH1547	Units
Load Voltage	400	V
Load Current	120	mA
Typical R_{ON}	23	Ω

- 3750 Vrms I/O isolation
- Current-limit protection
- Linear dc operation
- High-surge capability
- Clean, bounce-free switching
- Low power consumption
- High-reliability monolithic receptor
- Surface-mountable

APPLICATIONS

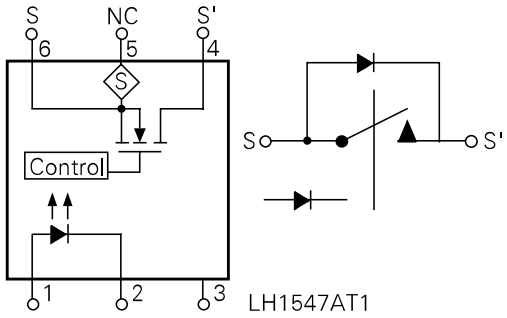
- General telecom switching
- Programmable controllers
- Industrial controls
- Instrumentation
- Peripherals

DESCRIPTION

The LH1547 is a SPST normally open unidirectional relay that can switch ac and 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 BICMOS technology, is comprised of a photodiode array, switch control circuitry, and a DMOS switch.

The LH1547 relay is packaged in a 6-pin DIP (LH1547AT1) or in a surface-mount gull wing (LH1547AAB1).

Figure 1. Functional Diagram (LH1547)



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 Absolute Maximum Ratings for extended periods can adversely affect the device reliability.

Parameter	Symbol	Value	Unit
Ambient Operating 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 Test Voltage (t=1 sec)	V_{ISO}	5300	Vrms
LED Input Ratings: Continuous Forward Current Reverse Voltage (I_R≤10 µA)	 I_F V_R	 50 10	 mA V
Output Operation: dc or Peak ac Load Voltage (I_L≤50 µA) Continuous dc Load Current	 V_L I_L	 400 120	 V mA
Power Dissipation	P_{DISS}	500	mW

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
LED Forward Current for Switch Turn-on (T_A=–40°C to +85°C)	I_{FON}	5	—	20	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 purposes only and are not part of the testing requirements.

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
LED Forward Current for Switch Turn-on	I_{Fon}	I_L=90 mA, t=10 ms	—	0.9	2	mA
LED Forward Current for Switch Turn-off	I_{Foff}	V_L=±350 V	0.1	0.4	—	mA
LED Forward Voltage	V_F	I_F=10 mA	1.15	1.22	1.45	V
ON-resistance	R_{ON}	I_F=5 mA	12	23	34	Ω
OFF-resistance	R_{OFF}	I_F=0 mA, V_L=±100 V	—	3300	—	GΩ
Current Limit	I_{LMT}	I_F=5 mA, t=5 ms V_L=10 V	150	210	270	mA
Output Off-state Leakage Current	—	I_F=0 mA, V_L=±100 V V_L=±400 V	— —	0.03 —	200 1.0	nA µA
Turn-on Time	t_{on}	I_F=5 mA, V_L=50 V R_L=1 kΩ	—	1.6	5.0	ms
Turn-off Time	t_{off}	I_F=5 mA, V_L=50 V R_L=1 kΩ	—	2.2	5.0	ms