LH1518AT/AAB/AABTR

1 Form A
Solid State Relay

FEATURES

- **5300 V_{RMS} I/O Isolation**
- **Current-limit Protection Built-in**
- **Linear AC/DC Operation**
- **High-reliability Monolithic Receptor**
- **Low Power Consumption**
- **Clean, Bounce-free Switching**
- **High Surge Capability**
- **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

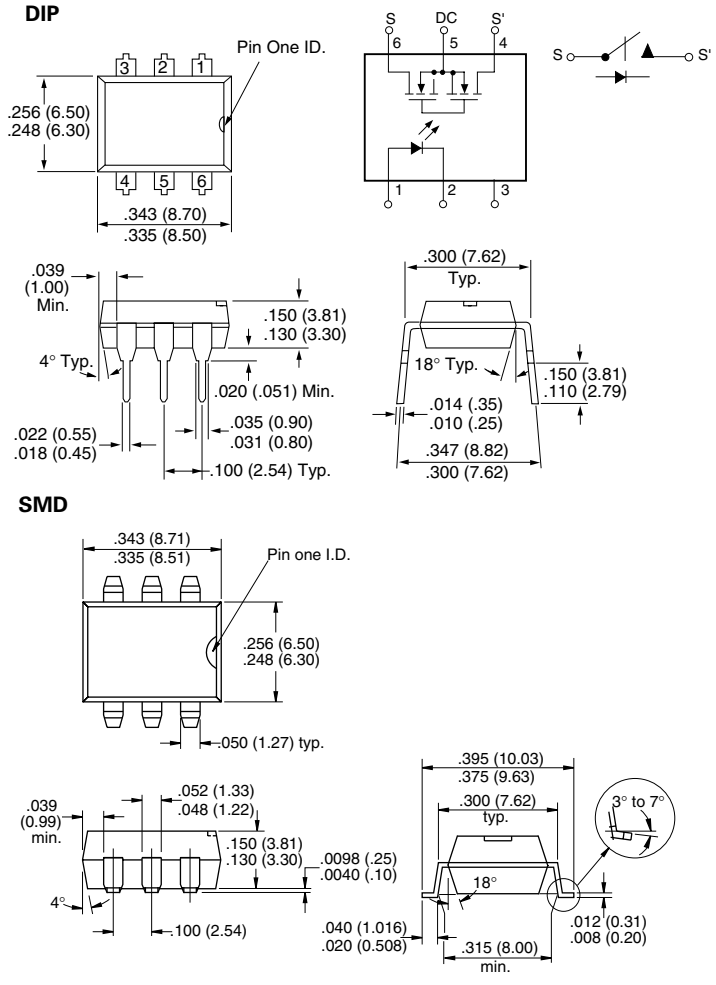
- **General Telecom Switching**
- **Instrumentation**
- **Industrial Controls**

DESCRIPTION

Infineon Solid State Relays (SSRs) are miniature, optically-coupled relays with high-voltage MOSFET outputs. The LH1518 relays are capable of switching AC or DC loads from as little as nanovolts to hundreds of volts. Likewise, the relays can switch currents in the range of nanoamps to hundreds of milliamps. The MOSFET switches are ideal for small signal switching and are primarily suited for dc or audio frequency applications.

The LH1518 relays feature a monolithic output die that minimizes wire bonds and permits easy integration of high-performance circuits such as current limiting in normally-open switches. The output die integrates the photodiode receptor array, turn-on and turn-off control circuitry, and the MOSFET switches. The optically-coupled input is controlled by a highly efficient GaAlAs infrared LED.

Package Dimensions in Inches (mm)

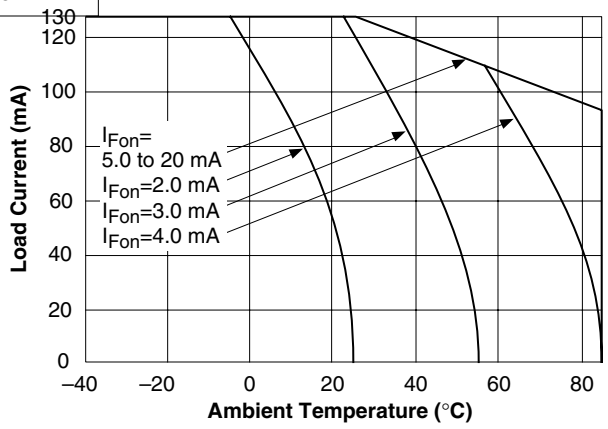


Part Identification

Part Number	Description
LH1518AT	6-pin DIP, Tubes
LH1518AAB	6-pin SMD, Gullwing, Tubes

LH1518AABTR	6-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 this document. Exposure to absolute Maximum Ratings for extended periods of time can adversely affect reliability.

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_{ISO}) .....5300 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) .....250 V
Continuous DC Load Current (I_L)
Bidirectional Operation .....155 mA
Unidirectional Operation .....300 mA
Peak Load Current (t=100 ms) (single shot) (I_P) ..... †
Output Power Dissipation (P_{DISS}) .....550 mW

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

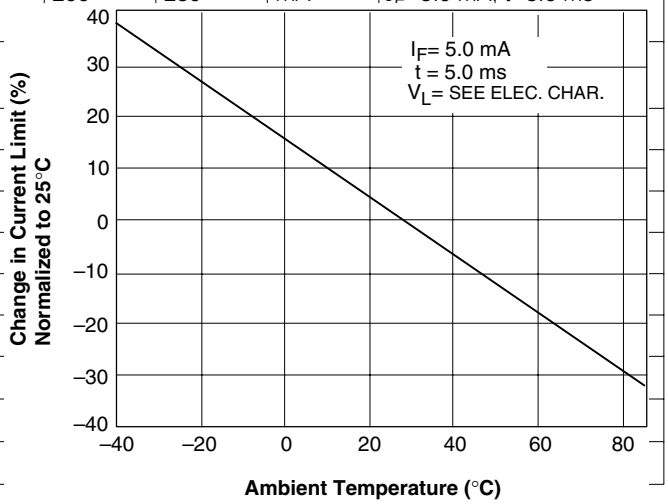
Electrical Characteristics, T_A=25°C

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}	—	0.8	2.0	mA	I_L=100 mA, t=10 ms
LED Forward Current, Switch Turn-off	I_{Foff}	0.2	0.7	—	mA	V_L±200 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}	10	15	20	Ω	I_F=5.0 mA, I_L=50 mA
dc: Pin 4, 6 (+) to 5 (±)		2.5	3.75	5.0		I_F=5.0 mA, I_L=100 mA
OFF-resistance	R_{OFF}	0.5	5000	—	GΩ	I_F=0 mA, V_L=±100 V

Current Limit ac/dc: Pin 4 (±) to 6 (±) dc: Pin 4, 6 (+) to 5 (±)	I_{LMT}	170 —	200 —	280 —	mA —	I_F=5.0 mA, t=5.0 ms —
Off-state Leakage Current	—	— —				
Output Capacitance Pin 4 to 6	—	— —				
Switch Offset	—	—				
Transfer						
Input/Output Capacitance	C_{ISO}	—				
Turn-on Time	t_{on}	—				
Turn-off Time	t_{off}	—				

Figure 3. Current Limit vs. Temperature



Typical Performance Characteristics

Figure 1. LED Current for Switch Turn-on vs. Temperature

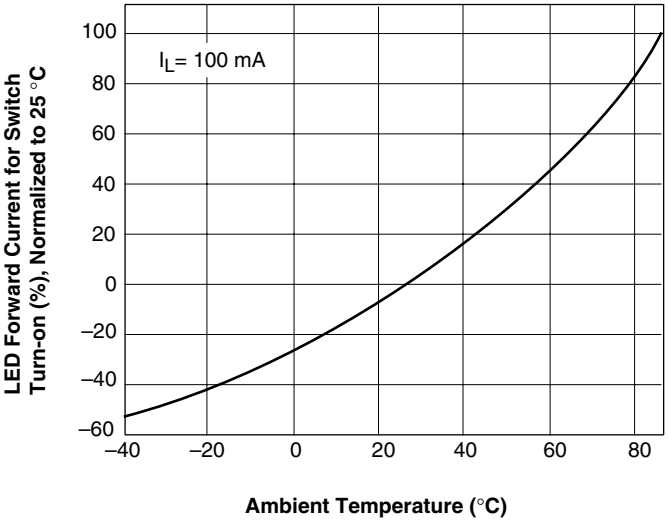


Figure 2. ON-Resistance vs. Temperature

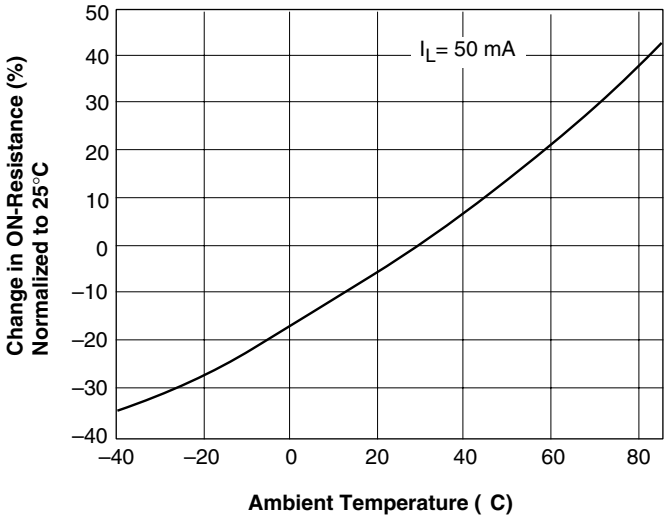


Figure 4. Switch Breakdown Voltage vs. Temperature

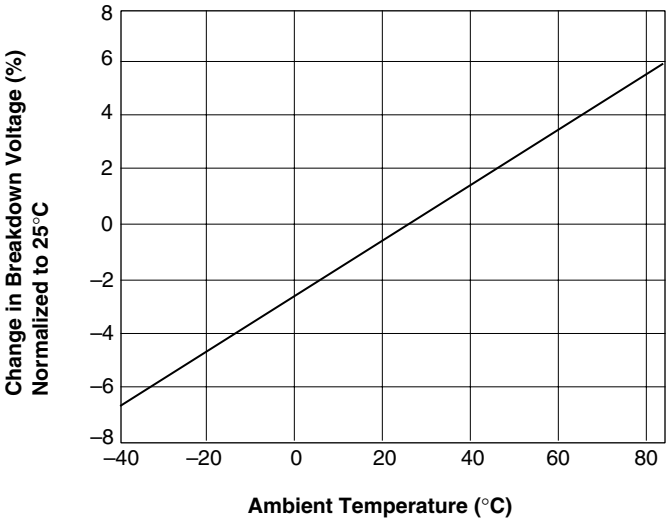


Figure 5. Switch Capacitance vs. Applied Voltage

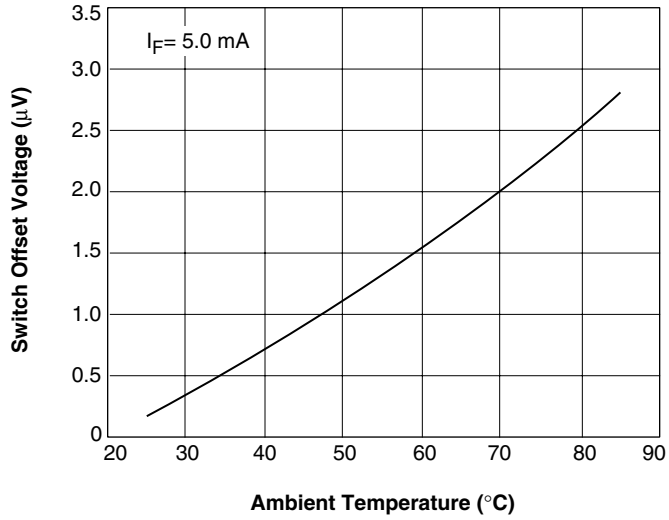


Figure 6. Switch Offset Voltage vs. Temperature

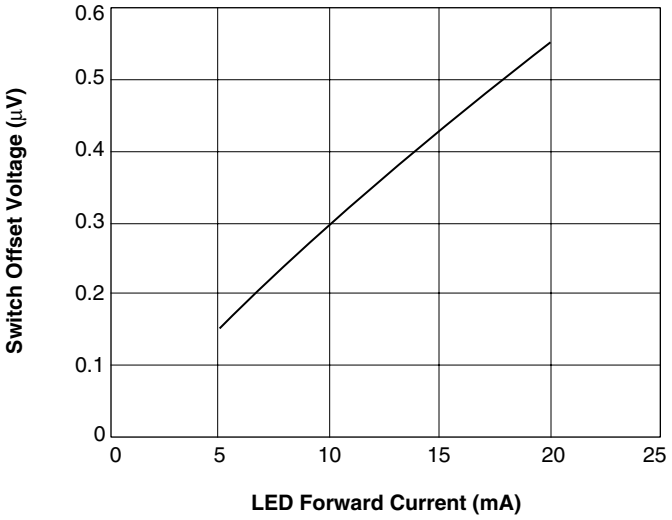


Figure 7. Leakage Current vs. Applied Voltage

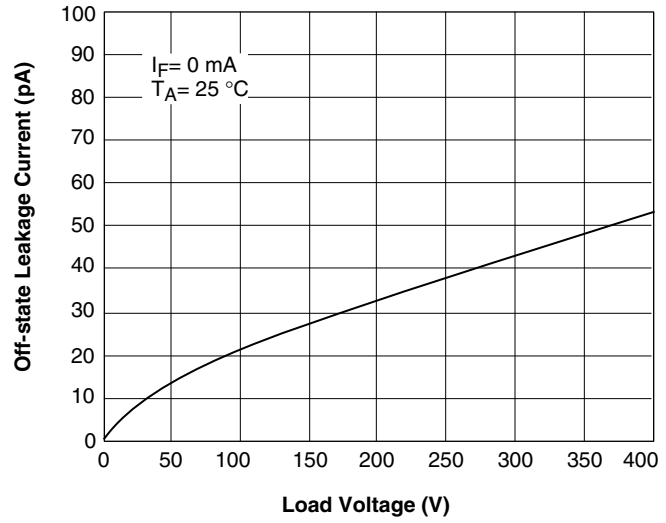


Figure 8. Leakage Current vs. Applied Voltage at Elevated Temperatures

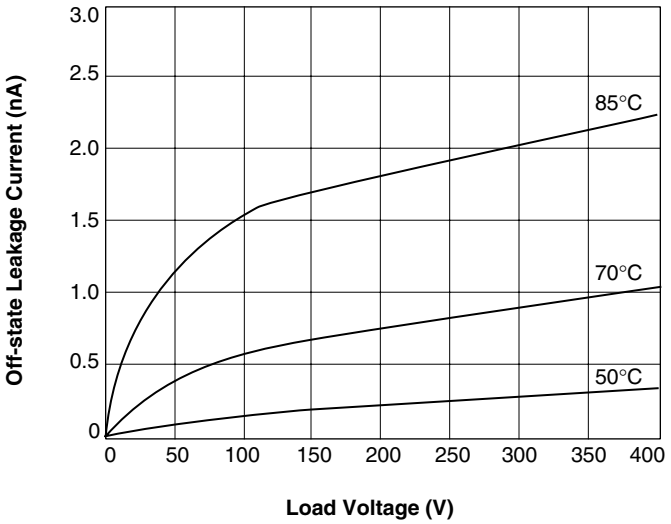


Figure 9. Turn-on Time vs. Temperature

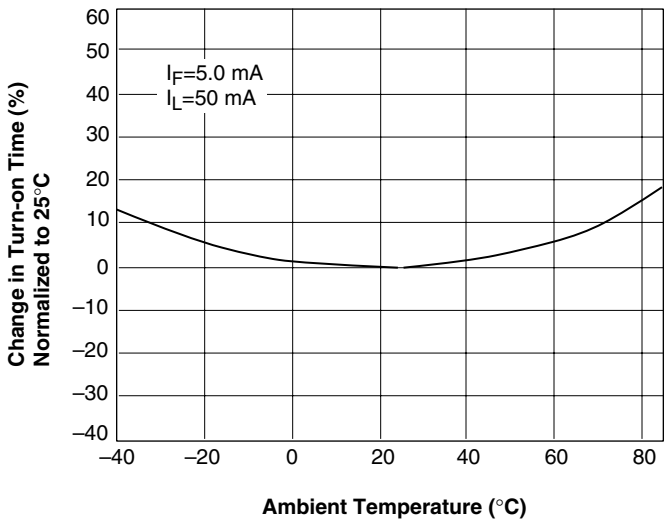


Figure 10. Turn-on Time vs. LED Current

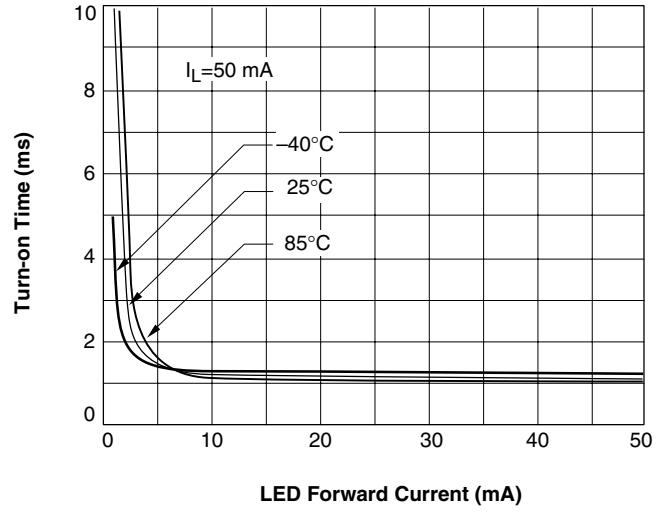


Figure 11. Turn-Off Time vs. LED Current