LH1521AB/AAC/AACTR

Dual 1 Form B State Relay

FEATURES

- **Dual Channel (LH1501)**
- **Current Limit Protection**
- **I/O Isolation, 5300 V_{RMS}**
- **Typical R_{ON} 20 Ω**
- **Load Voltage 350 V**
- **Load Current 150 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**

AGENCY APPROVALS

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

APPLICATIONS

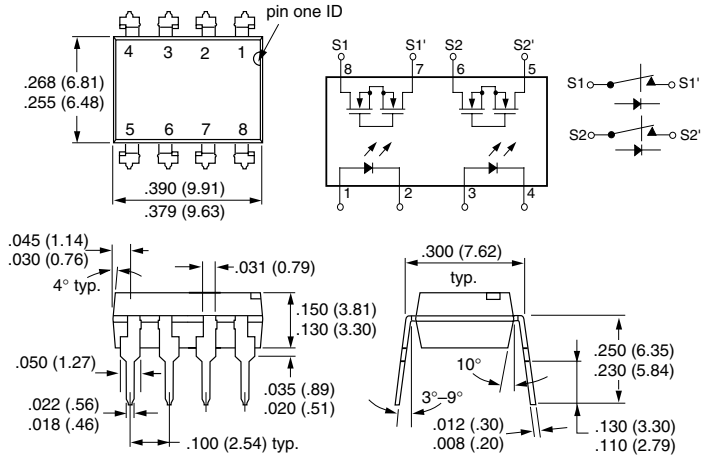
- **General Telecom Switching**
  - **On/off Hook Control**
  - **Ring Delay**
  - **Dial Pulse**
  - **Ground Start**
  - **Ground Fault Protection**
- **Instrumentation**
- **Industrial Controls**

DESCRIPTION

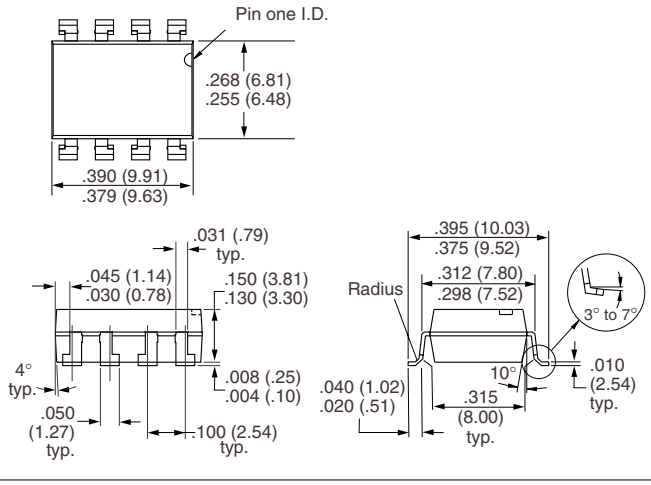
The LH1521 dual 1 Form B relays are SPST normally closed switches that can replace electromechanical relays in many applications. They are constructed using a GaAlAs LED for actuation control and an integrated monolithic die for the switch output. The die, fabricated in a high-voltage dielectrically isolated technology is comprised of a photodiode array, switch control circuitry, and MOSFET switches.

Package Dimensions in Inches (mm)

DIP



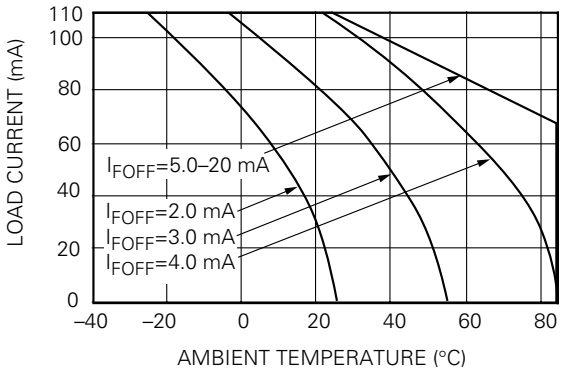
SMD



Part Identification

Part Number	Description
LH1521AB	8-pin DIP, Tubes
LH1521AAC	8-pin SMD, Gullwing, Tubes
LH1521AACTR	8-pin SMD, Gullwing, Tape and Reel

Recommended Operating Conditions



Both relays on with equal load currents.
For a single relay operation, refer to LH1501 Recommended Operating Conditions graph.

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
(t=1.0 s, I_{ISO}=10 µA max) (V_{ISO}) ..... 5300 V_{RMS}
Pole-to-Pole Isolation Voltage (S1 to S2)*
(dry air, dust free, at sea level) ..... 1600 V
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)
One Pole Operating ..... 150 mA
Two Poles Operating ..... 110 mA
Peak Load Current (t=100 ms) (single shot) (I_P) ..... 400 mA
Output Power Dissipation (continuous) (P_{DISS}) ..... 600 mW

* Breakdown occurs between the output pins external to the package.

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}	0.2	0.9	—	mA	I_L=±150 mA, t=10 ms
LED Forward Current, Switch Turn-off	I_{Foff}	—	1.0	2.0	mA	V_L±300 V
LED Forward Voltage	V_F	1.15	1.22	1.45	V	I_F=10 mA
Output						
ON-resistance	R_{ON}	12	20	25	Ω	I_F=0 mA, I_L=50 mA
OFF-resistance	R_{OFF}	0.1	1.4	—	GΩ	I_F=5.00 mA, V_L=±100 V
Off-state Leakage Current	—	—	0.07	1.0	µA	I_F=5.0 mA, V_L=±100 V
		—	0.08	1.0	µA	I_F=5.0 mA, V_L=±350 V
Output Capacitance	—	—	35	—	pF	I_F=5.0 mA, V_L=1.0 V
		—	10	—		I_F=5.0 mA, V_L=50 V
Pole-to-Pole Capacitance	—	—	0.5	—	pF	I_F=0 mA
Switch Offset	—	—	0.1	—	µV	I_F=0 mA
Transfer						
Input/Output Capacitance	C_{ISO}	—	1.1	—	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}	—	1.0	3.0	ms	I_F=5.0 mA, I_L=50 mA

Typical Performance Characteristics

Figure 1. LED Voltage vs. Temperature

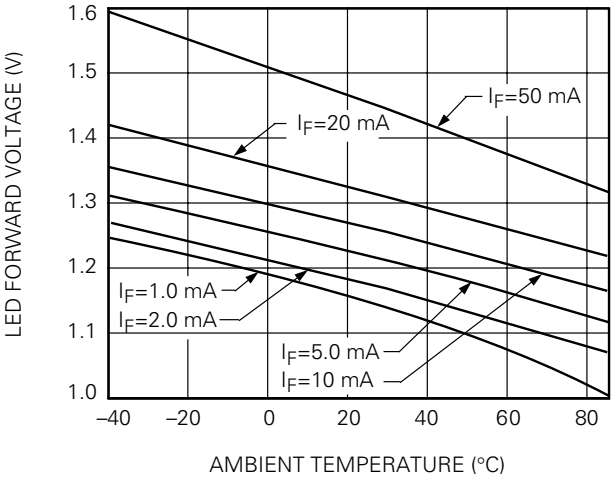


Figure 2. LED Dropout Voltage vs. Temperature

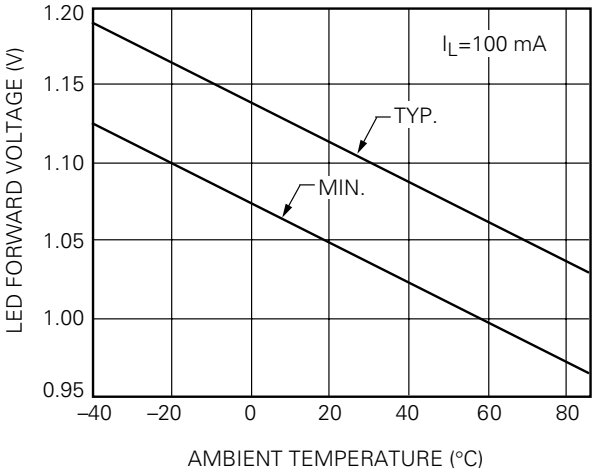


Figure 3. LED Current for Switch Turn-off vs. Temperature

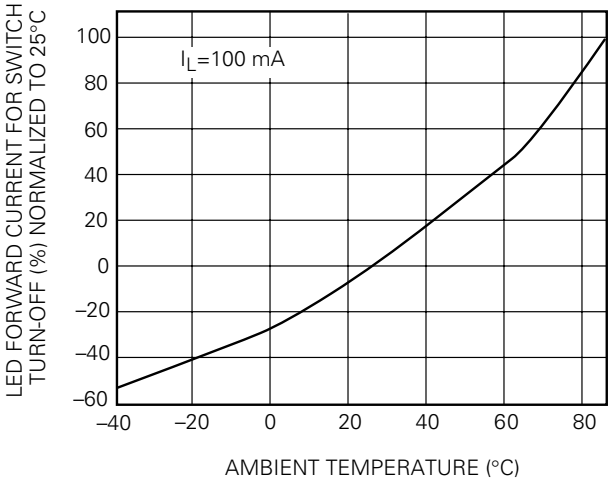


Figure 4. On-resistance vs. Temperature

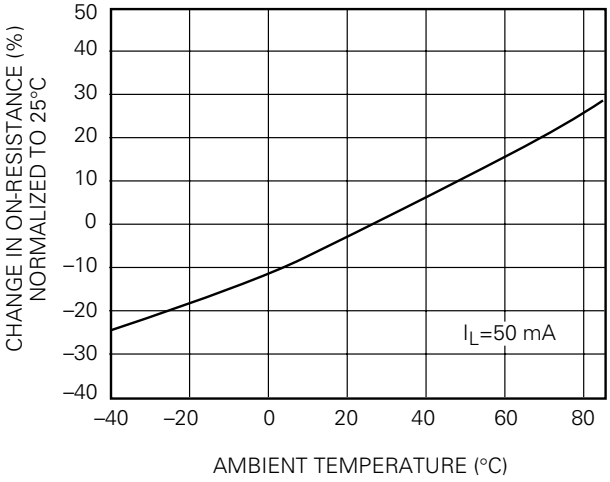


Figure 5. Switch Capacitance vs. Applied Voltage

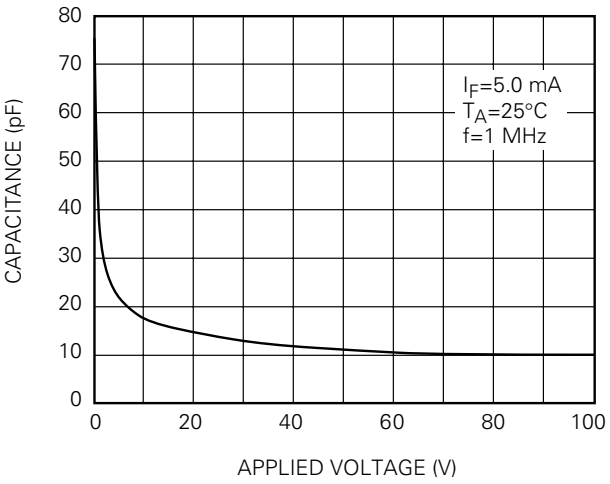


Figure 6. Output Isolation

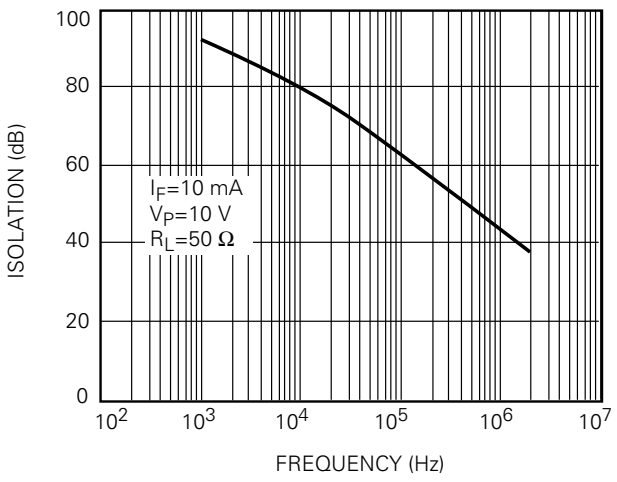


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Figure 7. Insertion Loss vs. Frequency

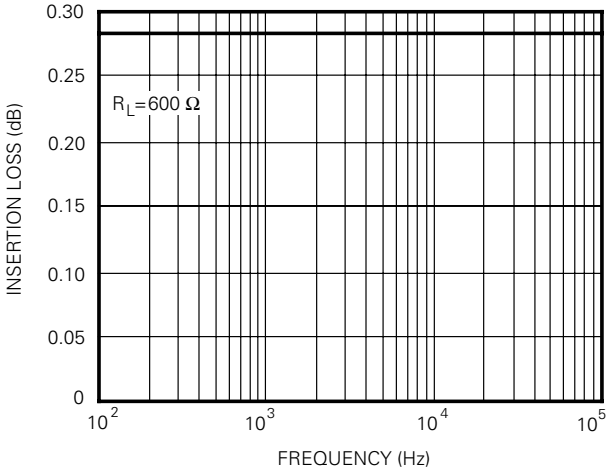

Figure 8. Leakage Current vs. Applied Voltage at 25°C

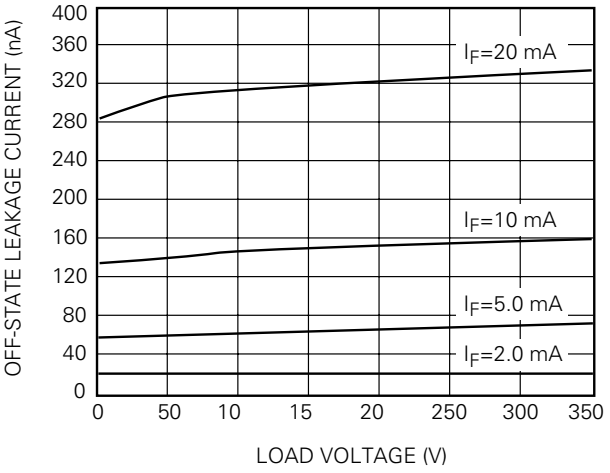

Figure 9. Leakage Current vs. Applied Voltage at 50°C

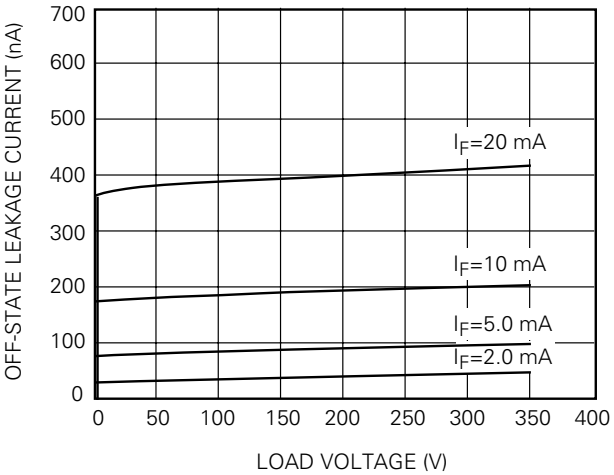

Figure 10. Leakage Current vs. Applied Voltage at 70°C

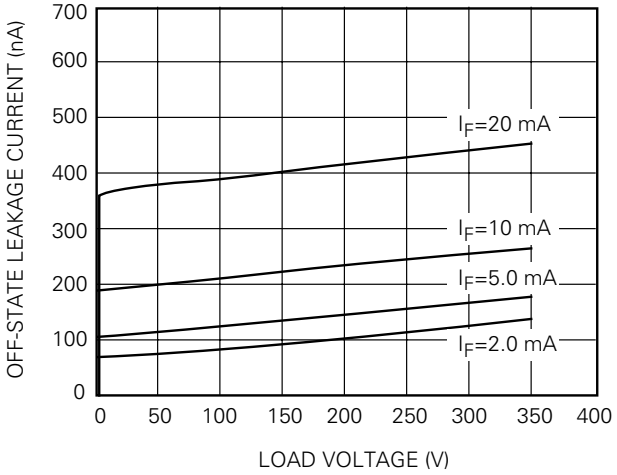

Figure 11. Leakage Current vs. Applied Voltage at 85°C

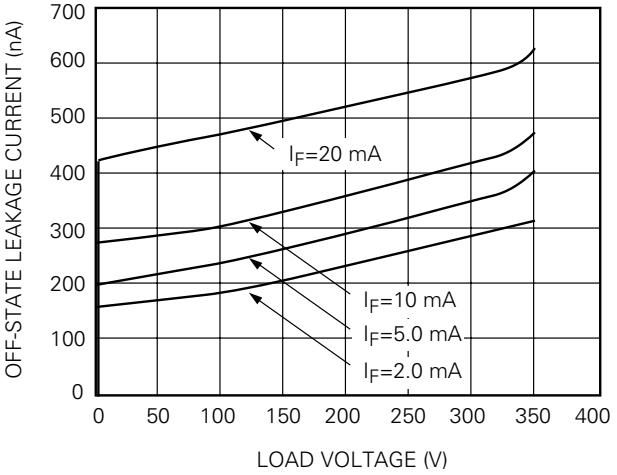

Figure 12. Switch Breakdown Voltage vs. Temperature

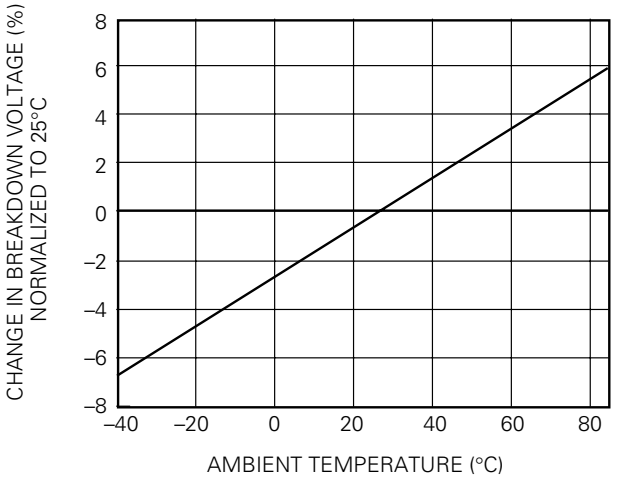

Figure 13. Switch Offset Voltage vs. Temperature

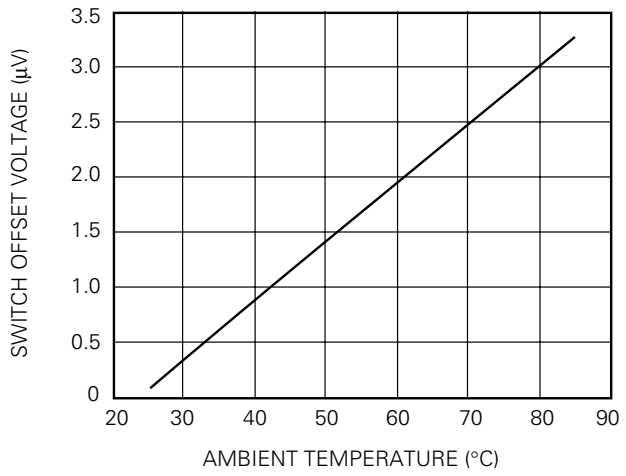

Figure 14. Turn-on/off Time vs. Temperature

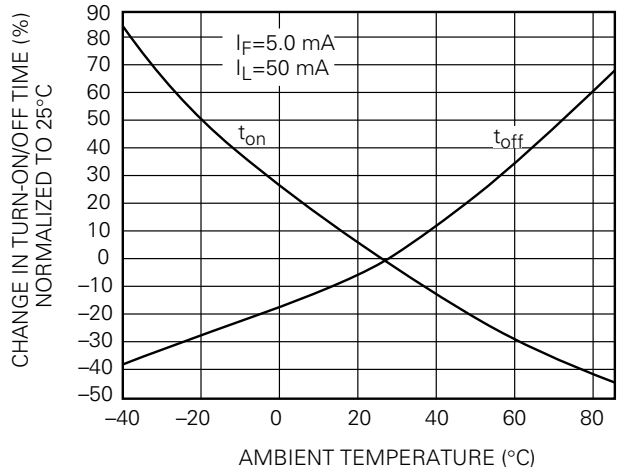

Figure 15. Turn-on Time vs. LED Current

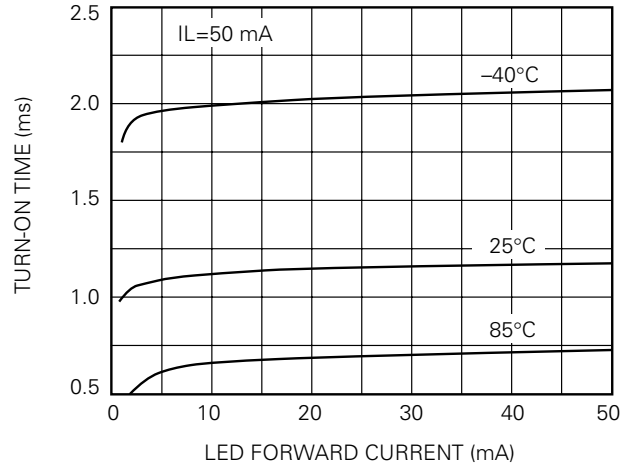

Figure 16. Turn-off Time vs. LED Current