LH1502BB/BAC/BACTR

Dual 1 Form A/B, C Solid State Relay

FEATURES

- Current Limit Protection
- I/O Isolation, 3750 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
- SMD Lead Available on Tape and Reel

AGENCY APPROVALS

- UL – File No. E52744
- CSA – Certification 093751
- BSI

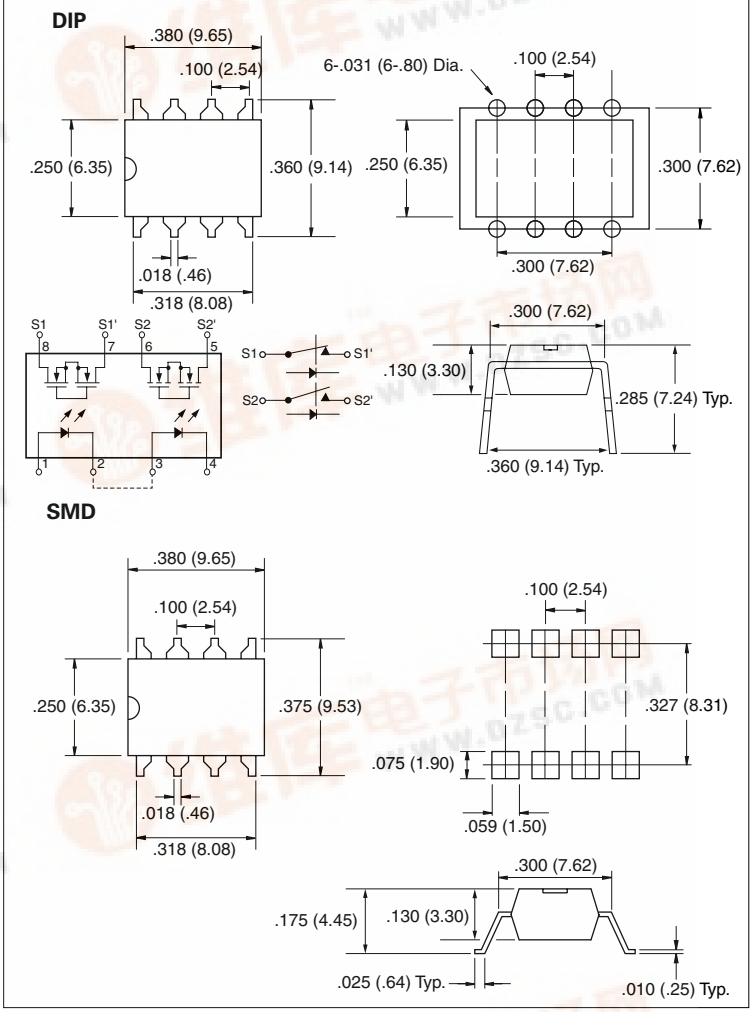
APPLICATIONS

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

DESCRIPTION

The LH1502 relays contain normally open and normally closed switches that can be used independently as a 1 Form A and 1 Form B relay, or when used together, as a 1 Form C relay. The relays are constructed as a mult.-chip hybrid device. Actuation contral is via an Infrared LED. The output switch is a combination of a photo-diode array with MOSFET switches and control circuity.

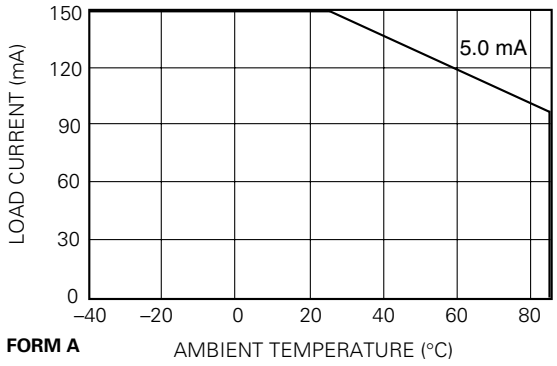
Package Dimensions in Inches (mm)



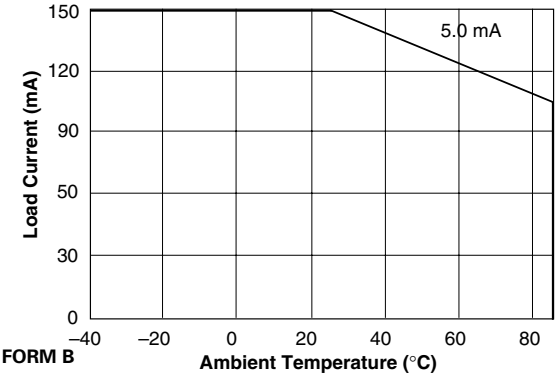
Part Identification

Part Number	Description
LH1502BB	8-pin DIP, Tubes
LH1502BAC	8-pin SMD, Gullwing, Tubes
LH1502BACTR	8-pin SMD, Gullwing, Tape and Reel

Recommended Operating Conditions



FORM A



FORM B

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 maximum rating conditions for extended periods can adversely affect device reliability.

Ambient Operating Temperature Range, T_A .....–40 to +85°C
Storage Temperature Range, T_{stg} .....–40 to +125°C
Pin Soldering Temperature, t=10 s max, T_S .....260°C
Input/Output Isolation Test Voltage,
t=1.0 s, I_{ISO}=10 µA max., V_{ISO} .....3750 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
(Form C Operation) .....150 mA
Peak Load Current, I_P
(t=100 ms) Form A .....†
(single shot) Form B .....350 mA
Output Power Dissipation (continuous), P_{DISS} .....600 mW

* Breakdown occurs between the output pins external to the package.
† Refer to Current Limit Performance Application Note 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 for Switch Turn-on (NO)	I_{Fon}	—	0.6	2.0	mA	I_L=100 mA, t=10 ms
LED Forward Current for Switch Turn-off (NO)	I_{Foff}	0.4	0.5	—	mA	V_L=±300 V
LED Forward Current for Switch Turn-on (NC)	I_{Fon}	0.2	0.9	—	mA	I_L=100 mA, t=10 ms
LED Forward Current for Switch Turn-off (NC)	I_{Foff}	—	1.0	2.0	mA	V_L=±300 V
LED Forward Voltage	V_F	1.15	1.26	1.45	V	I_F=10 mA
Output						
ON-resistance: (NO, NC)	R_{ON}	12	20	25	Ω	I_F=5.0 mA (NO) 0 mA (NC) I_L=50 mA (NC)
OFF-resistance: (NO)	R_{OFF}	0.35	5000	—	GΩ	I_F=0 mA, V_L=±100 V
(NC)		0.1	1.4	—		I_F=5.0 mA, V_L=±100 V
Current Limit (NO)	I_{LMT}	270	290	380	mA	I_F=5.0 mA, t=5.0 ms V_L=±5.0 V

Parameter	Sym.	Min.	Typ.	Max.	Units	Test Conditions
Off-state Leakage Current: (NO)	—	—	0.02	1000	nA	I_F=0 mA, V_L=±100 V
(NC)		—	0.07	1.0	µA	I_F=5.0 mA, V_L=±100 V
(NO, NC)		—	—	1.0		I_F=0 mA (NO) I_F=5.0 mA, V_L=±200 V
Output Capacitance: (NO)		—	50	—	pF	I_F=0 mA, V_L=50 V
(NC)		—	50	—		I_F=5.0 mA, V_L=50 V
Transfer						
Input/Output Capacitance	C_{ISO}	—	3.0	—	pF	V_{ISO}=1.0 V
Turn-on Time (NO)	t_{on}	0.2	3.2	6.0	ms	I_F=10 mA, I_L=37.5 mA V_L=150 V
(NC)		0.2	3.8	6.0		I_F=10 mA, I_L=37.5 mA V_L=150 V
Turn-off Time (NO)	t_{off}	—	1.6	3.0	ms	I_F=10 mA, I_L=37.5 mA V_L=150 V
(NC)		—	0.8	3.0		I_F=10 mA, I_L=37.5 mA V_L=150 V