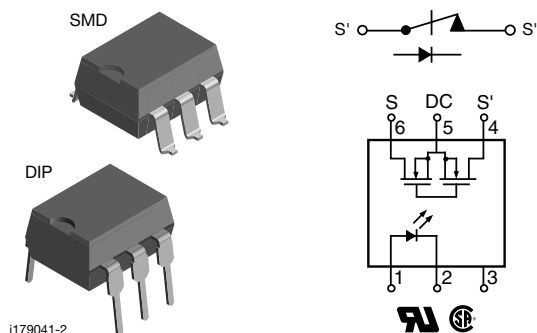


1 Form B Solid State Relay



FEATURES

- Isolation test voltage 3750 V_{RMS}
- Typical R_{ON} 20 Ω
- Load voltage 350 V
- Clean bounce free switching
- Low power consumption
- SMD lead available on tape and reel
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

The LH1501 relays are SPST normally closed switches (1 form B) that can replace electromechanical relays in many applications. The relays are constructed as a multi-chip hybrid device. Actuation control is via an infrared LED. The output switch is a combination of a photodiode array with MOSFET switches and control circuitry. The relays can be configured for AC/DC or DC only operation.

APPLICATIONS

- General telecom switching
- Security equipment
- Instrumentation
- Industrial controls

AGENCY APPROVALS

- [UL](#)
- [VDE](#)

ORDERING INFORMATION

SMD-6, tape and reel												
L	H	1	5	0	1	B	#	#	T	R		
PART NUMBER						ELECTR. VARIATION	PACKAGE CONFIG.		TAPE AND REEL			
PACKAGE						UL, CSA						
SMD-6, tubes						LH1501BAB						
SMD-6, tape and reel						LH1501BABTR						
DIP-6, tubes						LH1501BT						



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
LED continuous forward current		I_F	50	mA
LED reverse voltage	$I_R \leq 10\text{ }\mu\text{A}$	V_R	5	V
OUTPUT				
DC or peak AC load voltage	$I_L \leq 50\text{ }\mu\text{A}$	V_L	350	V
Continuous DC load current - bidirectional		I_L	150	mA
Continuous DC load current - unidirectional		I_L	200	mA
Peak load current (single shot)	$t = 100\text{ ms}$	I_P	350	mA
SSR				
Ambient temperature range		T_{amb}	-40 to +85	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40 to +125	$^{\circ}\text{C}$
Pin soldering temperature ⁽¹⁾	$t = 10\text{ s max.}$	T_{sld}	260	$^{\circ}\text{C}$
Input to output isolation voltage	$t = 1\text{ s}, I_{ISO} = 10\text{ }\mu\text{A max.}$	V_{ISO}	3750	V_{RMS}
Output power dissipation (continuous)		P_{diss}	550	mW

Notes

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. 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 the time can adversely affect reliability
- ⁽¹⁾ Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP)

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
LED forward current, switch turn-on	$I_L = \pm 150\text{ mA}, t = 10\text{ ms}$	I_{Fon}	0.2	0.9		mA
LED forward current, switch turn-off	$V_L = \pm 300\text{ V}$	I_{Foff}		1	2	mA
LED forward voltage	$I_F = 10\text{ mA}$	V_F	1.15	1.26	1.45	V
OUTPUT						
On-resistance, AC/DC: pin 4, 6 (+) to 5 (-)	$I_F = 0\text{ mA}, I_L = 50\text{ mA}$	R_{ON}		20	25	Ω
On-resistance, DC: pin 4, 6 (+) to 5 (-)	$I_F = 0\text{ mA}, I_L = 100\text{ mA}$	R_{ON}		5	6.25	Ω
Off-resistance	$I_F = 5\text{ mA}, V_L = \pm 100\text{ V}$	R_{OFF}	0.1	1.4		$G\Omega$
Off-state leakage current	$I_F = 5\text{ mA}, V_L = \pm 350\text{ V}$	I_O		0.08	1	μA
Output capacitance	$I_F = 5\text{ mA}, V_L = 50\text{ V}$	C_O		35		pF
TRANSFER						
Capacitance (input to output)	$V_{ISO} = 1\text{ V}$	C_{IO}		3		pF

Note

- 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.

SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn-on time	$I_F = 5\text{ mA}, I_L = 50\text{ mA}$	t_{on}		2	3	ms
Turn-off time	$I_F = 5\text{ mA}, I_L = 50\text{ mA}$	t_{off}		1	3	ms

TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

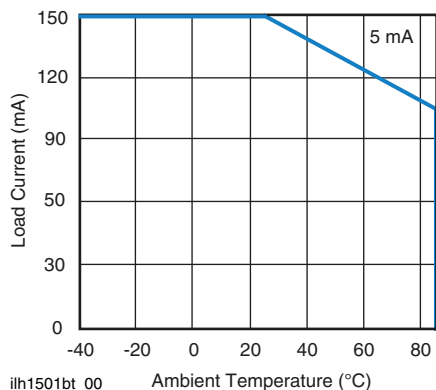
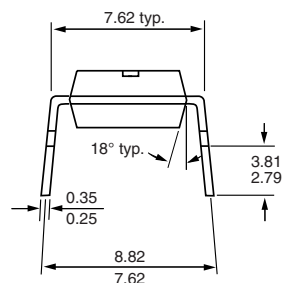
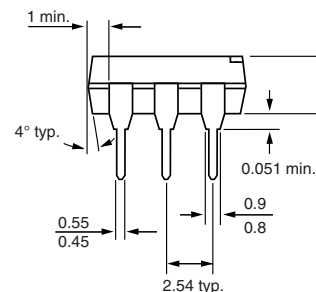
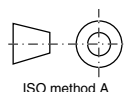
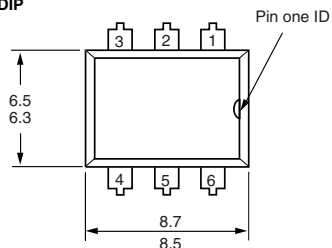


Fig. 1 - Maximum Load Current vs. Ambient Temperature

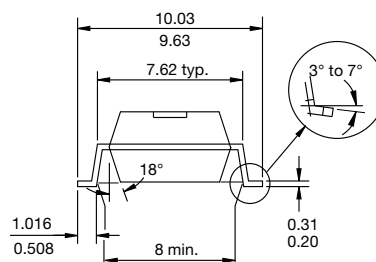
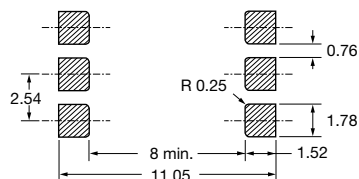
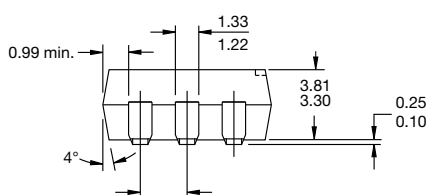
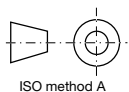
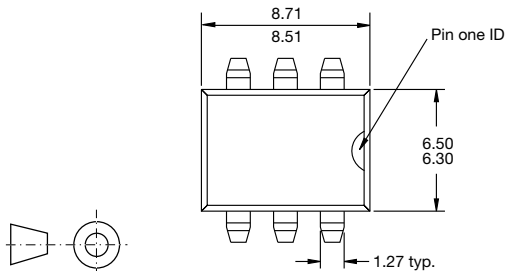
PACKAGE DIMENSIONS in millimeters

DIP



p178001

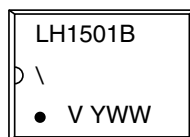
SMD



p178002



PACKAGE MARKING (example)



Note

- Tape and reel suffix (TR) is not part of the package marking

SOLDER PROFILES

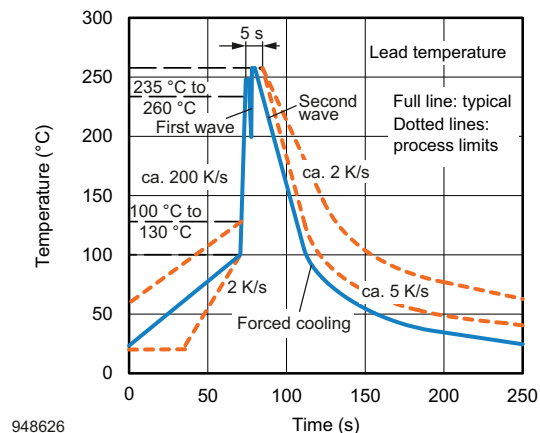


Fig. 2 - Wave Soldering Double Wave Profile
According to J-STD-020 for DIP Devices

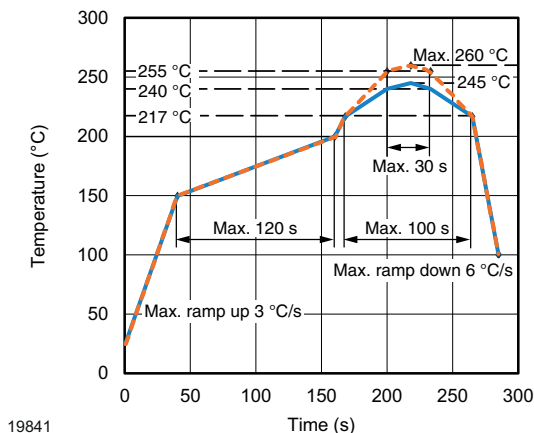


Fig. 3 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020 for SMD Devices

HANDLING AND STORAGE CONDITIONS

ESD level: HBM class 2

Floor life: unlimited

Conditions: $T_{amb} < 30\text{ °C}$, RH < 85 %

Moisture sensitivity level 1, according to J-STD-020



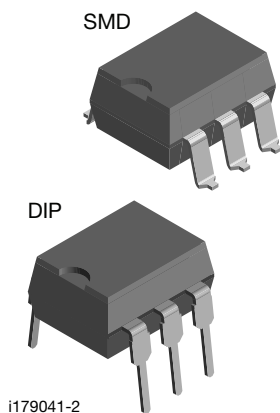
Footprint and Schematic Information for LH1501BAB, LH1501BABTR, LH1501BT

The footprint and schematic symbols for the following parts can be accessed using the associated links. They are available in Eagle, Altium, KiCad, OrCAD / Allegro, Pulsonix, and PADS.

Note that the 3D models for these parts can be found on the Vishay product page.

PART NUMBER	FOOTPRINT / SCHEMATIC
LH1501BAB	www.snapeda.com/parts/LH1501BAB/Vishay/view-part
LH1501BABTR	www.snapeda.com/parts/LH1501BABTR/Vishay/view-part
LH1501BT	www.snapeda.com/parts/LH1501BT/Vishay/view-part

For technical issues and product support, please contact optocoupleranswers@vishay.com.





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