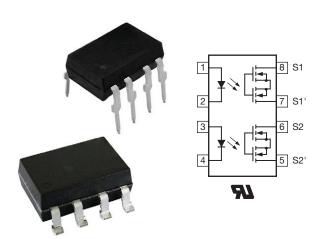
LH1522AB, LH1522AAC, LH1522AACTR

Vishay Semiconductors

Dual 1 Form A Solid-State Relay (Normally Open)



DESCRIPTION

The LH1522 dual 1 Form A relays are SPST normally open switches that can replace electromechanical relays in many applications. They are constructed using a GaAlAs LED for actuation control and MOSFET switches for the output. In addition, the LH1522 SSRs employ current-limiting circuitry when overvoltage protection is provided.

FEATURES

- Isolation test voltage 5300 V_{RMS}
- · Current limit protection
- Typical R_{ON} 12 Ω
- Load voltage 200 V
- Load current 200 mA / 140 mA
- · Clean bounce free switching
- Low power consumption
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

- General telecom switching
- Security equipment
- Instrumentation
- · Industrial controls
- · Automatic test equipment

AGENCY APPROVALS

• UL1577, file no. E52744

ORDERING INFORMATION		
L H 1 5 2 2 A PART NUMBER ELECTR. VARIATION	# # T R DIP SMD PACKAGE CONFIG. TAPE AND REEL 7.62 mm	
PACKAGE	UL	
SMD-8, tape and reel	LH1522AACTR	
SMD-8, tube	LH1522AAC	
DIP-8, tube	LH1522AB	

LH1522AB, LH1522AAC, LH1522AACTR

Vishay Semiconductors

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)				
PARAMETER	CONDITION	SYMBOL	VALUE	UNIT
INPUT				
IRED continuous forward current		I _F	50	mA
IRED reverse voltage		V_{R}	5	V
Input power dissipation		P _{diss}	80	mW
OUTPUT				
DC or peak AC load voltage		V _L	200	V
Continuous DC load current at 25 °C, one channel		ΙL	200	mA
Continuous DC load current at 25 °C, two channels		ΙL	140	mA
SSR output power dissipation		P _{diss}	550	mW
SSR		<u>.</u>		
Ambient temperature range		T _{amb}	-40 to +85	°C
Storage temperature range		T _{stg}	-40 to +150	°C
Soldering temperature	t = 10 s max.	T _{sld}	260	°C

Note

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.

ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
IRED forward current, switch turn-on	$I_L = 100 \text{ mA}, t = 10 \text{ ms}$	I _{Fon}	-	0.4	2	mA
IRED forward current, switch turn-off	$V_{L} = \pm 200 \text{ V}$	I _{Foff}	0.05	0.35	-	mA
IRED forward voltage	I _F = 10 mA	V_{F}	1.15	1.36	1.45	٧
IRED reverse current	V _R = 5 V	I _R	-	-	10	μA
OUTPUT						
On-resistance	$I_F = 5 \text{ mA}, I_L = 50 \text{ mA}$	R _{ON}	ı	12	15	Ω
Off-resistance	$I_F = 0 \text{ mA}, V_L = \pm 100 \text{ V}$	R _{OFF}	0.5	5000	-	GΩ
Off state leakage assument	$I_F = 0 \text{ mA}, V_L = \pm 100 \text{ V}$	l ₀	ı	< 1	200	nA
Off-state leakage current	$I_F = 0 \text{ mA}, V_L = \pm 200 \text{ V}$	Io	ı	< 1	1000	nA
Output capacitance pin 3 to 4	$I_F = 0 \text{ mA}, V_L = 1 \text{ V}, 1 \text{ MHz}$	Co	ı	39	-	pF
Output capacitance pin 3 to 4	$I_F = 0 \text{ mA}, V_L = 50 \text{ V}, 1 \text{ MHz}$	Co	-	6	-	pF
Current limit AC/DC	$I_F = 5 \text{ mA}, t = 5 \text{ ms}, V_L = \pm 6 \text{ V}$	I _{limit}	300	440	550	mA
TRANSFER						
Capacitance (input to output)	$V_{IO} = 1 V$	C _{IO}	ı	0.4	-	pF

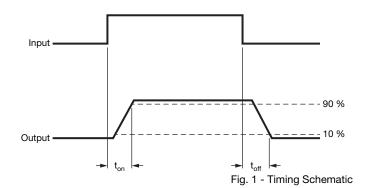
Note

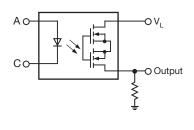
Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering
evaluations. Typical values are for information only and are not part of the testing requirements.

SWITCHING CHARACTERISTICS (T _{amb} = 25 °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}	-	0.20	2	ms
Turn-off time	$I_F = 5 \text{ mA}, I_L = 50 \text{ mA}$	t _{off}	-	0.04	2	ms

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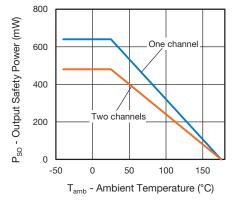


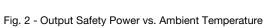


PARAMETER	CONDITION	SYMBOL	VALUE	UNIT
Climatic classification	According to IEC 68 part 1		40 / 85 / 21	
Pollution degree	According to DIN VDE 0109		2	
Comparative tracking index	Insulation group IIIa	CTI	175	
Maximum rated withstanding isolation voltage	According to UL1577, t = 1 min	V _{ISO}	5300	V_{RMS}
Maximum transient isolation voltage	According to DIN EN 60747-5-5	V _{IOTM}	8000	V _{peak}
Maximum repetitive peak isolation voltage	According to DIN EN 60747-5-5	V _{IORM}	890	V _{peak}
Insulation resistance	$V_{IO} = 500 \text{ V}, T_{amb} = 25 \text{ °C}$	R _{IO}	≥ 10 ¹²	Ω
insulation resistance	V _{IO} = 500 V, T _{amb} = 100 °C	R _{IO}	≥ 10 ¹¹	Ω
O to took to see a	One channel	D	640	mW
Output safety power	Two channels	P_{SO}	480	
Input acfety ourrent	One channel	1	240	mA
Input safety current	Two channels	I _{SI}	200	
Safety temperature		T _S	175	°C
Creepage distance			≥ 7	mm
Clearance distance			≥ 7	mm
Insulation thickness		DTI	≥ 0.4	mm
Input to output test voltage, method B	$V_{IORM} \times 1.875 = V_{PR}$, 100 % production test with $t_M = 1$ s, partial discharge < 5 pC	V _{PR}	1669	V _{peak}
Input to output test voltage, method A	V_{IORM} x 1.6 = V_{PR} , 100 % sample test with t_M = 10 s, partial discharge < 5 pC	V _{PR}	1424	V _{peak}

Note

As per IEC 60747-5-5, § 7.4.3.8.2, this optocoupler is suitable for "safe electrical insulation" only within the safety ratings. Compliance with
the safety ratings shall be ensured by means of protective circuits.





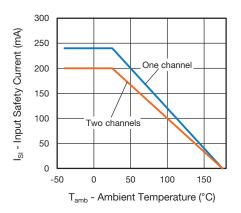


Fig. 3 - Input Safety Current vs. Ambient Temperature

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

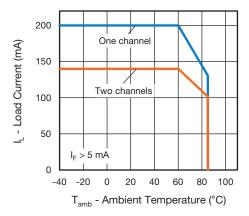


Fig. 4 - Load Current vs. Ambient Temperature

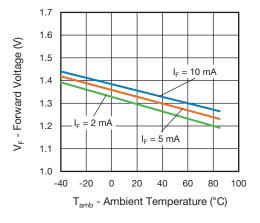


Fig. 5 - Forward Voltage vs. Ambient Temperature

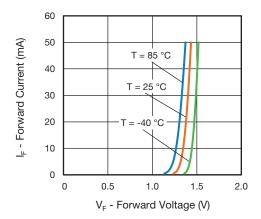


Fig. 6 - Forward Current vs. Forward Voltage

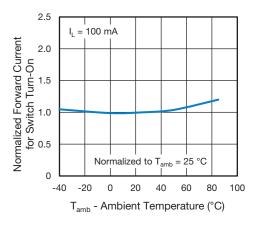


Fig. 7 - Normalized Forward Current vs. Ambient Temperature

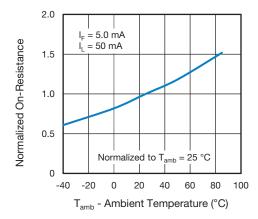


Fig. 8 - Normalized On-Resistance vs. Ambient Temperature

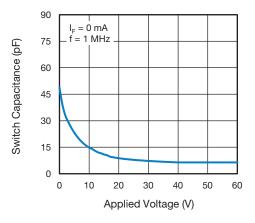


Fig. 9 - Switch Capacitance vs. Load Voltage

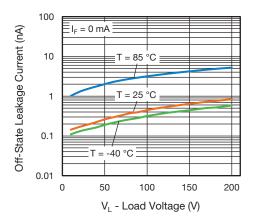


Fig. 10 - Leakage Current vs. Load Voltage

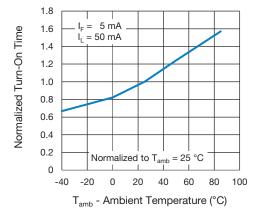


Fig. 11 - Normalized Turn-On Time vs. Ambient Temperature

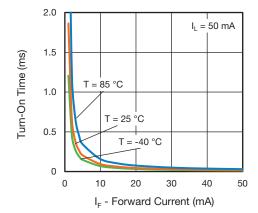


Fig. 12 - Turn-On Time vs. Forward Current

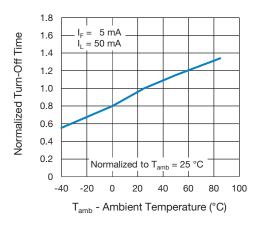


Fig. 13 - Normalized Turn-Off Time vs. Ambient Temperature

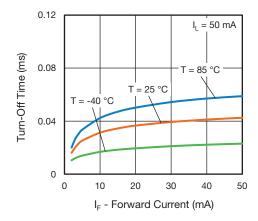


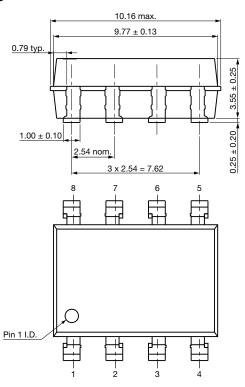
Fig. 14 - Turn-Off Time vs. Forward Current

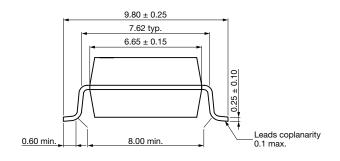


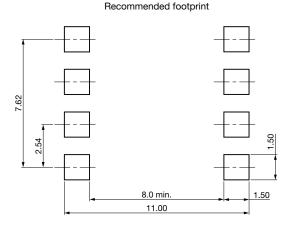


PACKAGE DIMENSIONS in millimeters

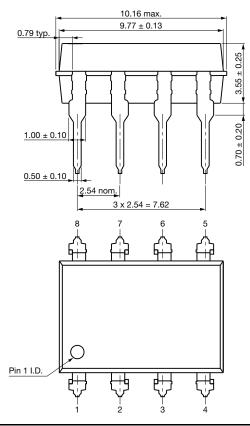
SMD-8

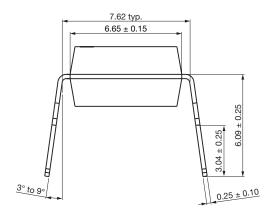






DIP-8





PACKAGE MARKING (example)



Fig. 15 - LH1522

Note

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

PACKING INFORMATION (in millimeters)

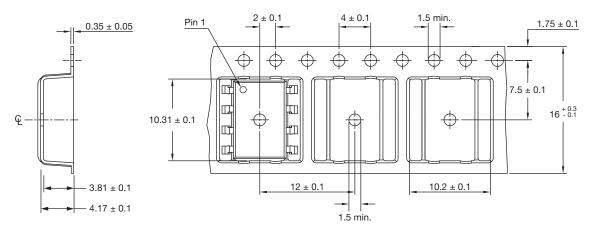


Fig. 16 - Tape and Reel Packing

TAPE AND REEL PACKING		
TYPE	UNITS/REEL	
SMD-8	1000	

TUBE PACKING			
TYPE	UNITS/TUBE	TUBES/BOX	UNITS/BOX
SMD-8	50	40	2000
DIP-8	50	40	2000

SOLDER PROFILES

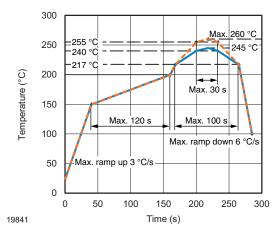


Fig. 17 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020 for SMD Devices

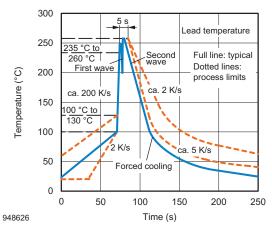


Fig. 18 - Wave Soldering Double Wave Profile According to J-STD-020 for DIP Devices

HANDLING AND STORAGE CONDITIONS

ESD level: HBM class 2 Floor life: unlimited

Conditions: T_{amb} < 30 °C, RH < 60 %

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





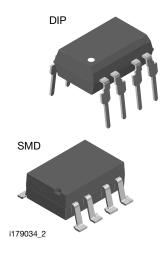
Footprint and Schematic Information for LH1522AAC, LH1522AACTR, LH1522AB

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
LH1522AAC	www.snapeda.com/parts/LH1522AAC/Vishay/view-part
LH1522AACTR	www.snapeda.com/parts/LH1522AACTR/Vishay/view-part
LH1522AB	www.snapeda.com/parts/LH1522AB/Vishay/view-part

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





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