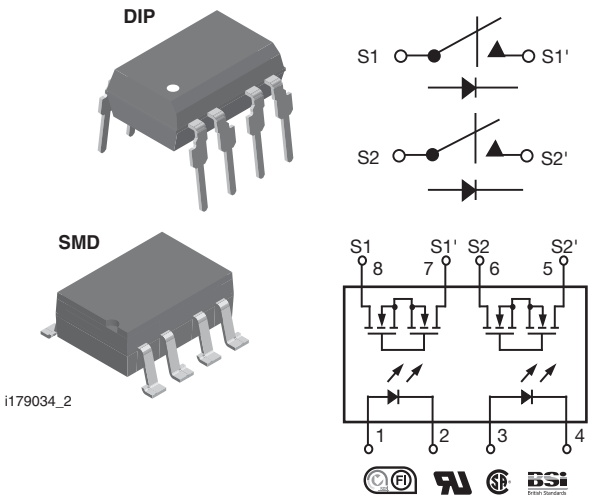
Dual 1 Form A Solid-State Relay



FEATURES

- Dual channel 1 form A
- Extremely low operating current
- High speed operation
- Isolation test voltage 5300 V_{RMS}
- Current limit protection
- High surge capability
- DC only option
- Clean bounce free switching
- Low power consumption
- High reliability monolithic receptor
- Surface mountable
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e3

RoHS COMPLIANT

DESCRIPTION

The LH1526 relay are two SPST normally open switches that can replace electromechanical relays in many applications. The relays require a minimal amount of LED drive current to operate, making it ideal for battery powered and power consumption sensitive applications. The relay is constructed using a GaAlAs LED for actuation control and an integrated monolithic die for the switch output. The die is, fabricated in a high-voltage dielectrically isolated technology, comprised of a photodiode array, switch-control circuitry, and MOSFET switches. In addition, the relay employs current-limiting circuitry, enabling it to pass lightning surge testing as per ANSI/TIA-968-B and other regulatory surge requirements when overvoltage protection is provided. The relay can be configured for AC/DC or DC-only operation.

APPLICATIONS

- General telecom switching
  - Telephone line interface
  - On/off hook
  - Ring relay
  - Break switch
  - Ground start
- Battery powered switch applications
- Industrial controls
  - Microprocessor control of solenoids, lights, motors, heaters, etc.
- Instrumentation

Note

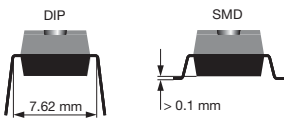
- See “solid-state relays” (application note 56)

AGENCY APPROVALS

UL1577:	file no. E52744 system code H, double protection
CSA:	certification no. 093751
BSI/BABT:	certification no. 7980
FIMKO:	25419

ORDERING INFORMATION

L	H	1	5	2	6	A	#	#	T	R
PART NUMBER						ELECTR. VARIATION	PACKAGE CONFIG.		TAPE AND REEL	



PACKAGE	UL, CSA, BSI, FIMKO
SMD-8, tubes	LH1526AAC
SMD-8, tape and reel	LH1526AACTR
DIP-8, tubes	LH1526AB

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ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
INPUT				
LED input ratings: continuous forward current		I_F	50	mA
LED input ratings: reverse voltage		V_R	8	V
OUTPUT				
Output operation: DC or peak AC load voltage	$I_L \leq 50$ µA	V_L	400	V
Continuous DC load current, one pole operation		I_L	125	mA
Continuous DC load current, two poles operation		I_L	100	mA
SSR				
Ambient operating temperature range		T_{amb}	- 40 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 150	°C
Pin soldering temperature [1]	t = 10 s max.	T_{sld}	260	°C
Input to output isolation test voltage	t = 1 s, I_{ISO} = 10 µA max.	V_{ISO}	5300	V_{RMS}
Power dissipation		P_{diss}	600	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 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
INPUT						
LED forward current, switch turn-on	I_L = 70 mA, t = 10 ms	I_{Fon}		0.3	0.5	mA
LED forward current, switch turn-off	V_L = ± 350 V, t = 100 ms	I_{Foff}	0.001	0.1		mA
LED forward voltage	I_F = 1.5 mA	V_F	0.80	1.15	1.40	V
OUTPUT						
On-resistance: AC/DC, each pole	I_F = 1.5 mA, I_L = ± 50 mA	R_{ON}	17	25	36	Ω
Off-resistance	I_F = 0 mA, V_L = ± 100 V	R_{OFF}		5000		GΩ
Current limit	I_F = 1.5 mA, t = 5 ms, V_L = ± 7 V	I_{LMT}	170	210	270	mA
Off-state leakage current	I_F = 0 mA, V_L = ± 100 V	I_O		0.04	200	nA
	I_F = 0 mA, V_L = ± 400 V	I_O			1	µA
Output capacitance	I_F = 0 mA, V_L = 1 V	C_O		37		pF
	I_F = 0 mA, V_L = 50 V	C_O		13		pF
Switch offset	I_F = 5 mA	V_{OS}		0.25		µV
TRANSFER						
Capacitance (input to output)	V_{ISO} = 1 V	C_{IO}		0.8		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 = 1.5 mA, I_L = 50 mA	t_{on}		1		ms
	I_F = 5 mA, I_L = 50 mA	t_{on}		0.5	1	ms
Turn-off time	I_F = 1.5 mA, I_L = 50 mA	t_{off}		0.2		ms
	I_F = 5 mA, I_L = 50 mA	t_{off}		1.1	1.5	ms

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

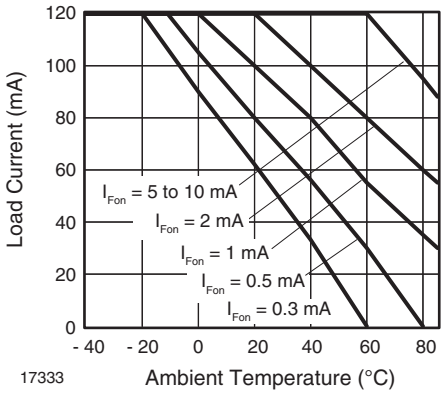

Fig. 1 - Recommended Operating Conditions

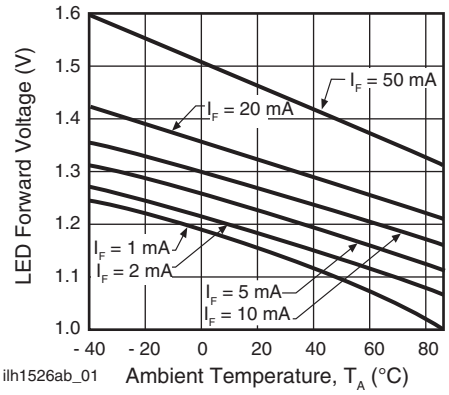

Fig. 2 - LED Voltage vs. Temperature

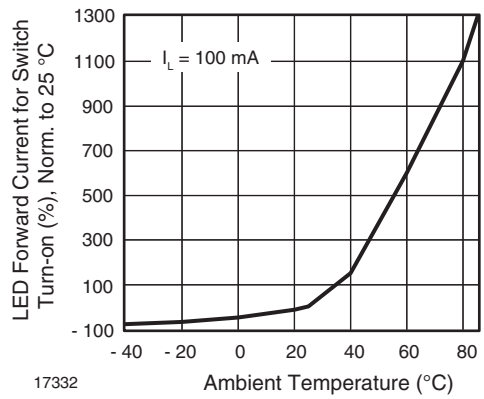

Fig. 3 - LED Current for Switch Turn-on vs. Temperature

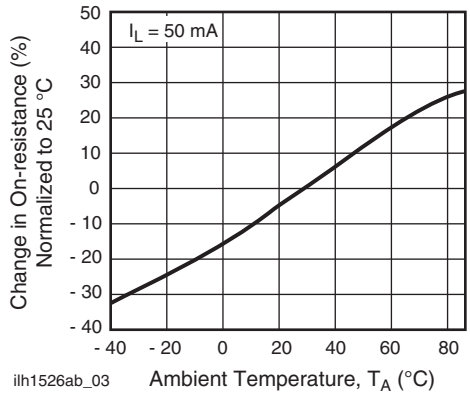

Fig. 4 - On-Resistance vs. Temperature

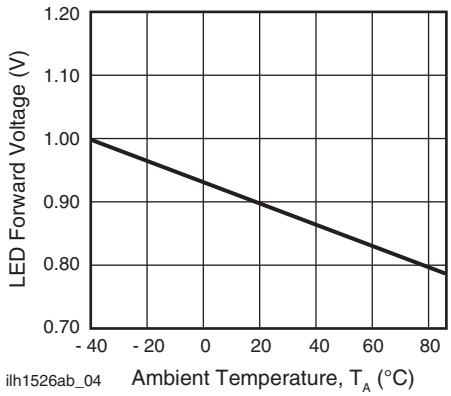

Fig. 5 - LED Dropout Voltage vs. Temperature

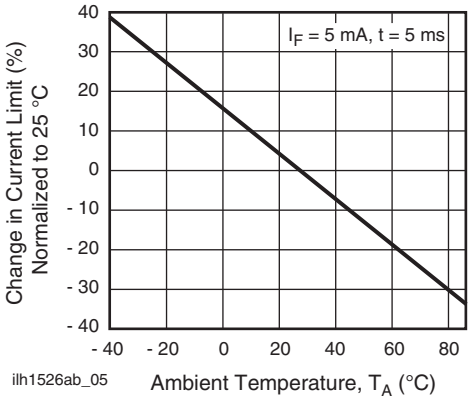

Fig. 6 - Current Limit vs. Temperature

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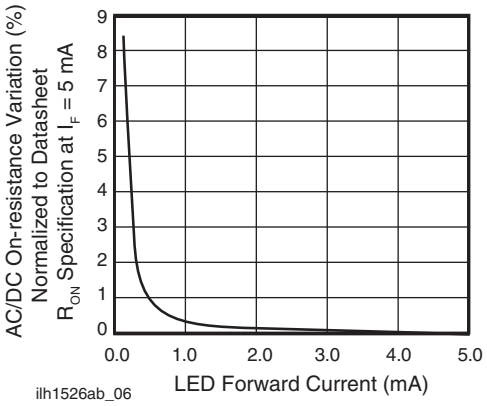

Fig. 7 - Variation in On-Resistance vs. LED Current

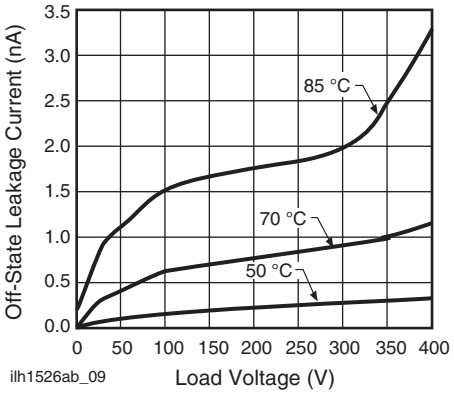

Fig. 10 - Leakage Current vs.
Applied Voltage at Elevated Temperatures

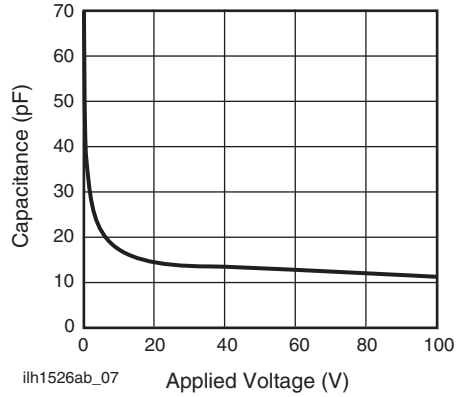

Fig. 8 - Switch Capacitance vs. Applied Voltage

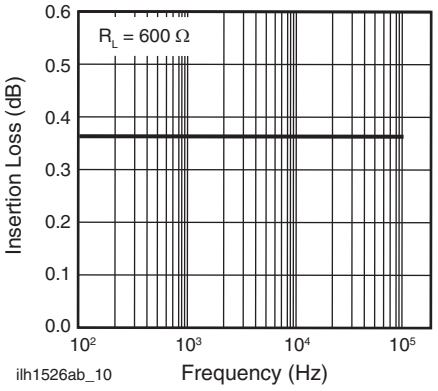

Fig. 11 - Insertion Loss vs. Frequency

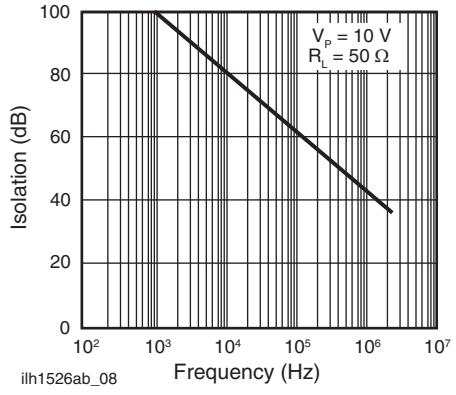

Fig. 9 - Output Isolation

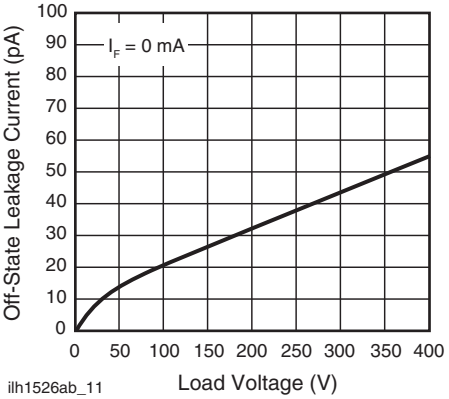

Fig. 12 - Leakage Current vs. Applied Voltage

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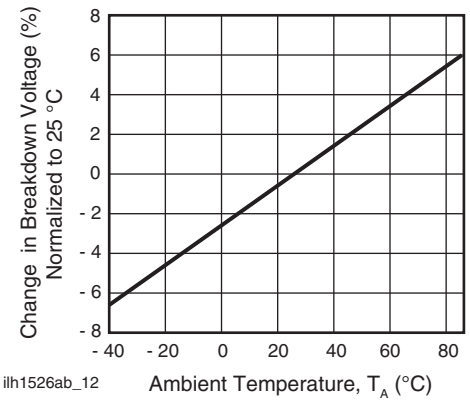

Fig. 13 - Switch Breakdown Voltage vs. Temperature

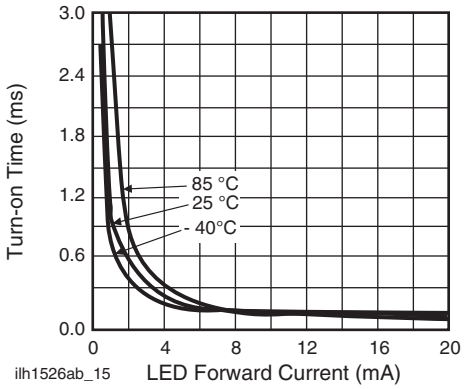

Fig. 16 - Turn-on Time vs. LED Current

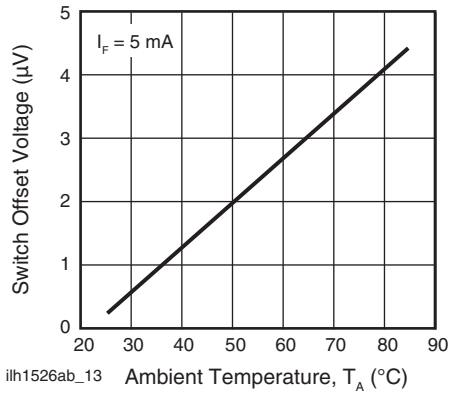

Fig. 14 - Switch Offset Voltage vs. Temperature

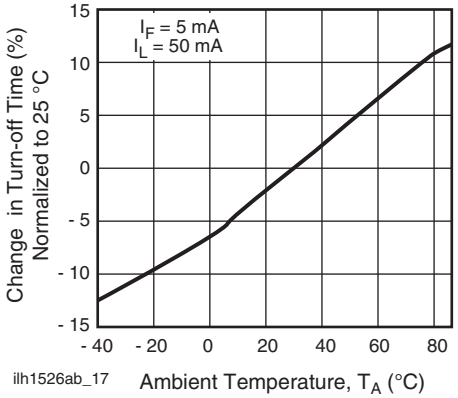

Fig. 17 - Turn-off Time vs. Temperature

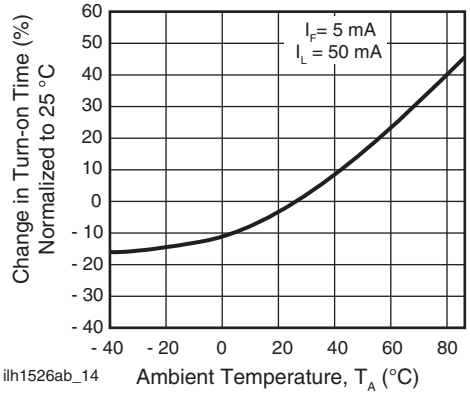

Fig. 15 - Turn-on Time vs. Temperature

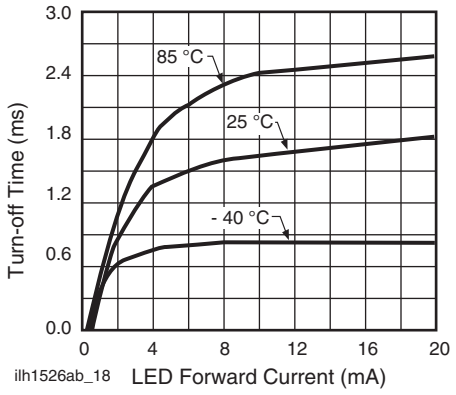

Fig. 18 - Turn-off Time vs. LED Current

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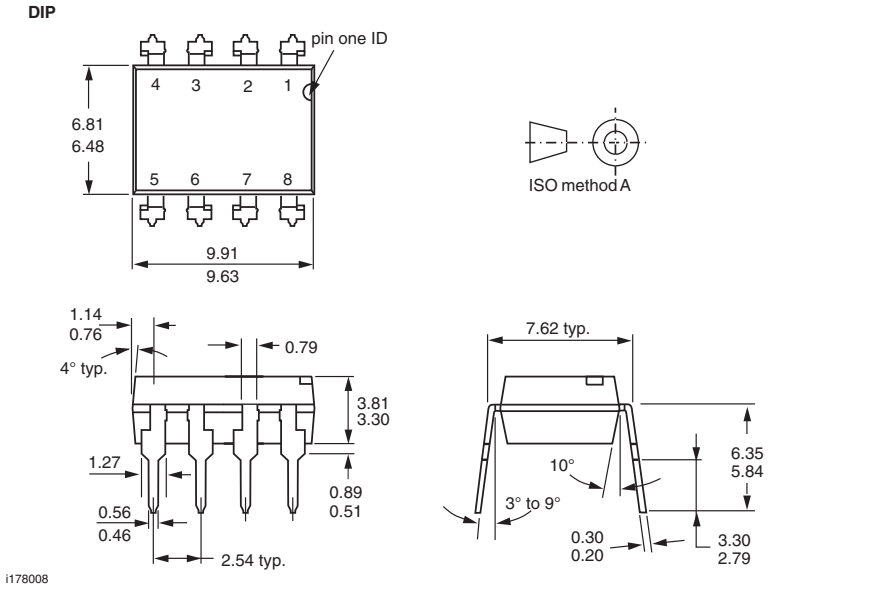
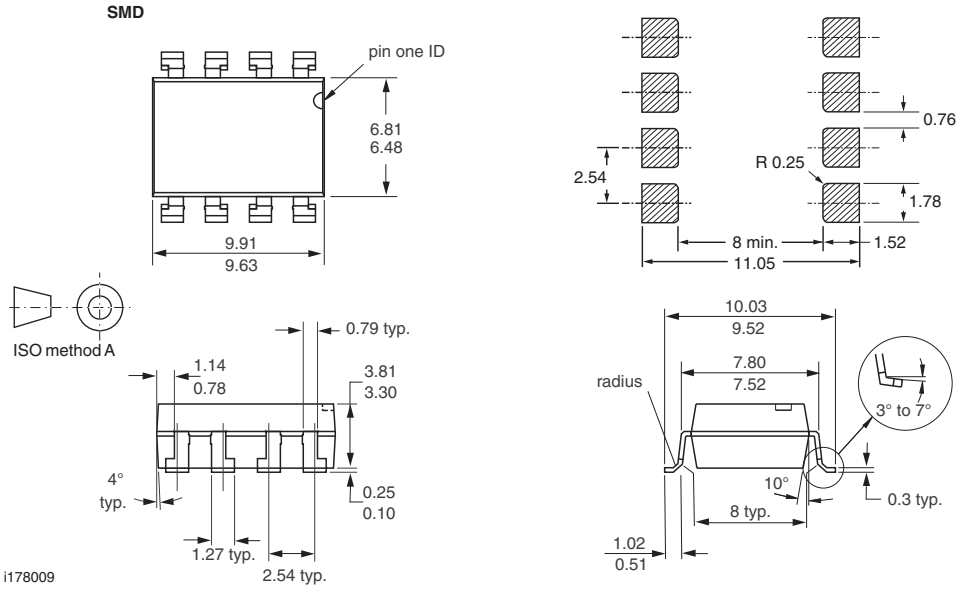
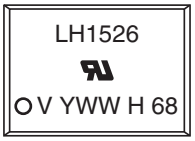
PACKAGE DIMENSIONS in millimeters





PACKAGE MARKING (example)



Note

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

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Footprint and Schematic Information for LH1526AAC, LH1526AACTR, LH1526AB

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
LH1526AAC	www.snapeda.com/parts/LH1526AAC/Vishay/view-part
LH1526AACTR	www.snapeda.com/parts/LH1526AACTR/Vishay/view-part
LH1526AB	www.snapeda.com/parts/LH1526AB/Vishay/view-part

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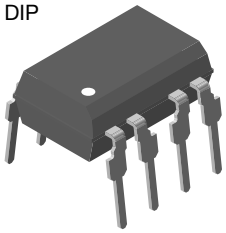
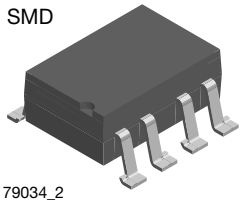
DIP



SMD



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