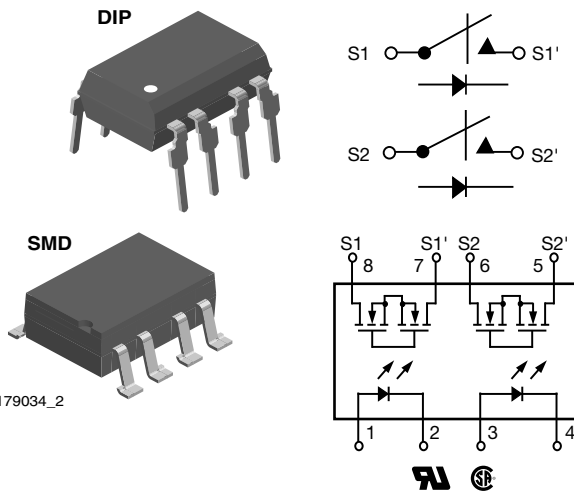


Dual 1 Form A Solid-State Relay



FEATURES

- Dual channel (LH1546)
- Current limit protection
- Isolation test voltage 5300 V_{RMS}
- Typical R_{ON} 28 Ω
- Load voltage 350 V
- Load current 120 mA
- High surge capability
- 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

APPLICATIONS

- General telecom switching
 - On/off hook control
 - Ring relay
 - Dial pulse
 - Ground start
 - Ground fault protection
- Instrumentation
- Industrial controls

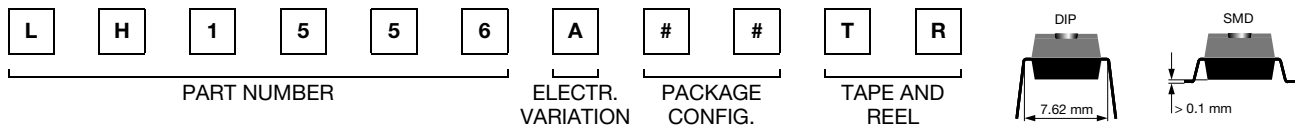
AGENCY APPROVALS

- UL1577 file no. E52744 system code H, double protection
- CSA certification no. 093751

DESCRIPTION

The LH1556 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 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. In addition, the LH1556 SSRs employ current-limiting circuitry, enabling them to pass lightning surge testing as per ANSI/TIA-968-B and other regulatory surge requirements when overvoltage protection is provided.

ORDERING INFORMATION



PACKAGE	UL, CSA
SMD-8, tubes	LH1556AAC



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	8.0	V
OUTPUT				
DC or peak AC load voltage	$I_L \leq 50\text{ }\mu\text{A}$	V_L	350	V
Continuous DC load current, one pole operating		I_L	120	mA
Continuous DC load current, two poles operating		I_L	110	mA
SSR				
Peak load current (single shot)	$t = 100\text{ ms}$	I_P	(1)	mA
Ambient temperature range		T_{amb}	-40 to +85	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40 to +150	$^{\circ}\text{C}$
Pin soldering temperature (2)	$t = 10\text{ s max.}$	T_{sld}	260	$^{\circ}\text{C}$
Input to output isolation voltage		V_{ISO}	5300	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 current limit performance application note for a discussion on relay operation during transient currents.

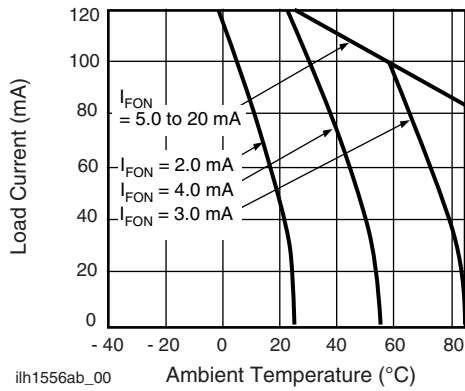
ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
LED forward current, switch turn-on	$I_L = 100\text{ mA}$, $t = 10\text{ ms}$	I_{Fon}		1.1	2.0	mA
LED forward current, switch turn-off	$V_L = \pm 350\text{ V}$	I_{Foff}	0.2	1.0		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 (\pm) to 6 (\pm)	$I_F = 5.0\text{ mA}$, $I_L = 50\text{ mA}$	R_{ON}		28	35	Ω
On-resistance DC: pin 4, 6 (+) to 5 (-)	$I_F = 5.0\text{ mA}$, $I_L = 100\text{ mA}$	R_{ON}		7.0	10	Ω
Off-resistance	$I_F = 0\text{ mA}$, $V_L = \pm 100\text{ V}$	R_{OFF}	0.5	300		G Ω
Current limit AC/DC	$I_F = 5.0\text{ mA}$, $V_L = \pm 6.0\text{ V}$, $t = 5.0\text{ ms}$	I_{LMT}	170	210	250	mA
Off-state leakage current	$I_F = 0\text{ mA}$, $V_L = \pm 100\text{ V}$	I_O		0.35	200	nA
	$I_F = 0\text{ mA}$, $V_L = \pm 350\text{ V}$	I_O		0.096	1.0	μA
Output capacitance pin 4 to 6	$I_F = 0\text{ mA}$, $V_L = 1.0\text{ V}$	C_O		18		pF
	$I_F = 0\text{ mA}$, $V_L = 50\text{ V}$	C_O		6.7		pF
Switch offset	$I_F = 5.0\text{ mA}$	V_{OS}		0.3		μV
TRANSFER						
Capacitance (input to output)	$V_{ISO} = 1.0\text{ V}$	C_{IO}		0.67		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.

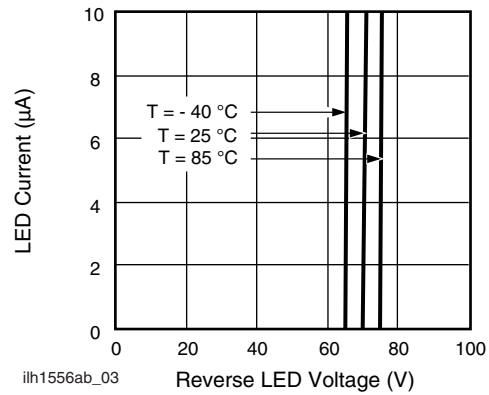
SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn-on time	$I_F = 5.0\text{ mA}$, $I_L = 50\text{ mA}$	t_{on}		1.14	3.0	ms
Turn-off time	$I_F = 5.0\text{ mA}$, $I_L = 50\text{ mA}$	t_{off}		0.71	3.0	ms

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



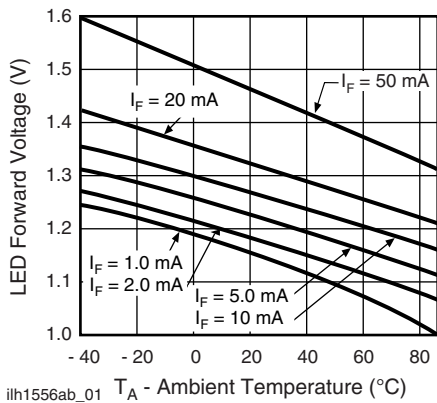
ilh1556ab_00

Fig. 1 - Recommended Operating Conditions



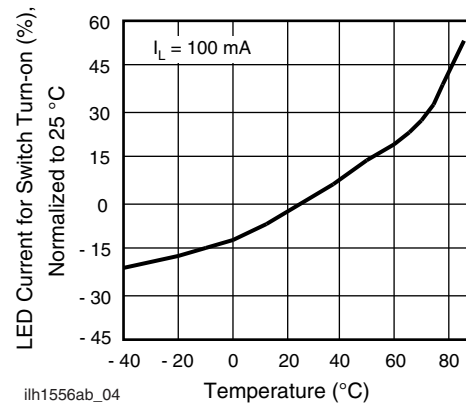
ilh1556ab_03

Fig. 4 - LED Reverse Current vs. LED Reverse Voltage



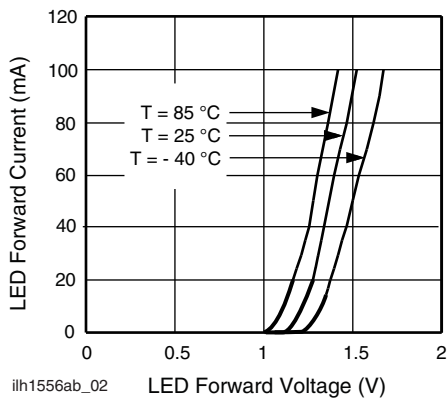
ilh1556ab_01

Fig. 2 - LED Voltage vs. Temperature



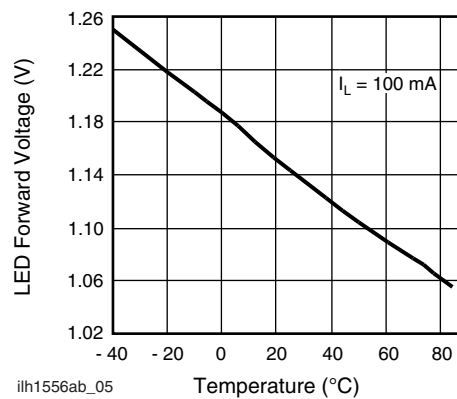
ilh1556ab_04

Fig. 5 - LED Current for Switch Turn-on vs. Temperature



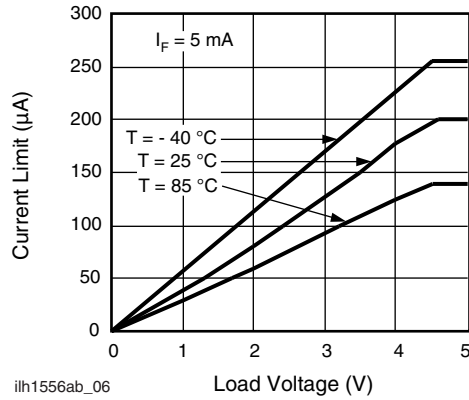
ilh1556ab_02

Fig. 3 - LED Forward Current vs. LED Forward Voltage



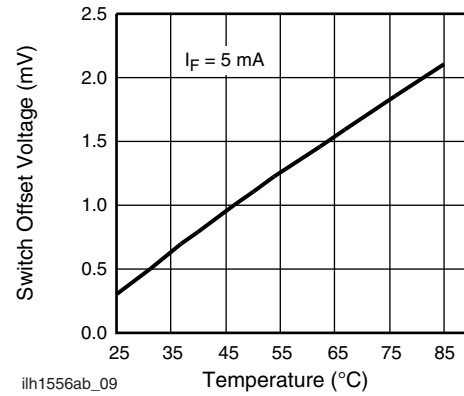
ilh1556ab_05

Fig. 6 - LED Dropout Voltage vs. Temperature



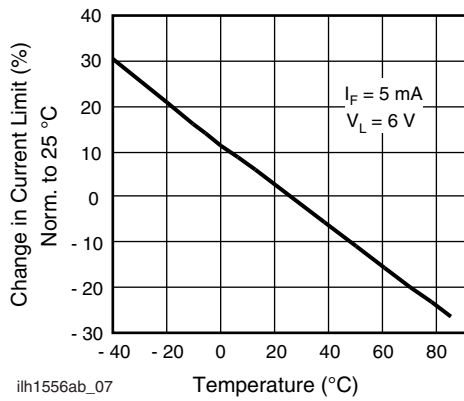
ilh1556ab_06

Fig. 7 - Load Current vs. Load Voltage



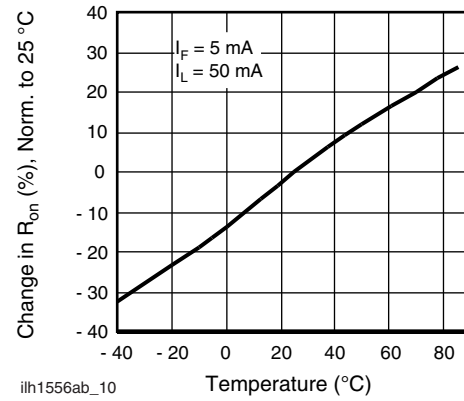
ilh1556ab_09

Fig. 10 - Switch Offset Voltage vs. LED Current



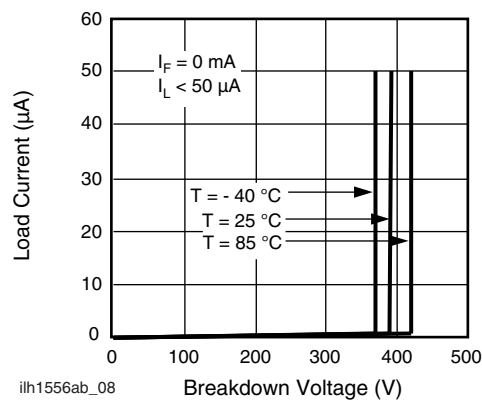
ilh1556ab_07

Fig. 8 - Current Limit vs. Temperature



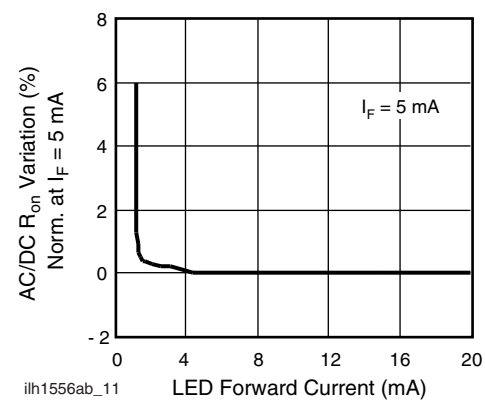
ilh1556ab_10

Fig. 11 - On-Resistance vs. Temperature



ilh1556ab_08

Fig. 9 - Switch Breakdown Voltage vs. Load Current



ilh1556ab_11

Fig. 12 - Variation in On-Resistance vs. LED Current

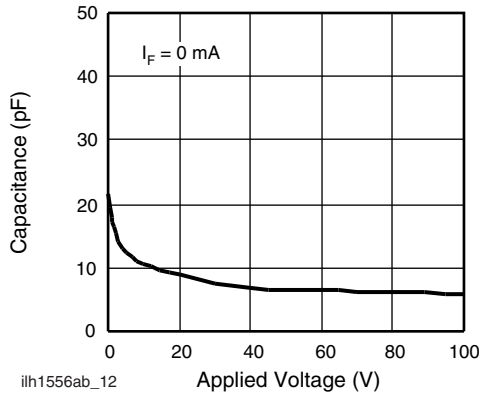


Fig. 13 - Switch Capacitance vs. Applied Voltage

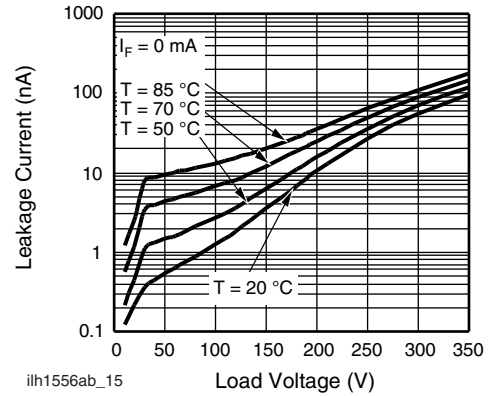


Fig. 16 - Leakage Current vs. Applied Voltage at Elevated Temperatures

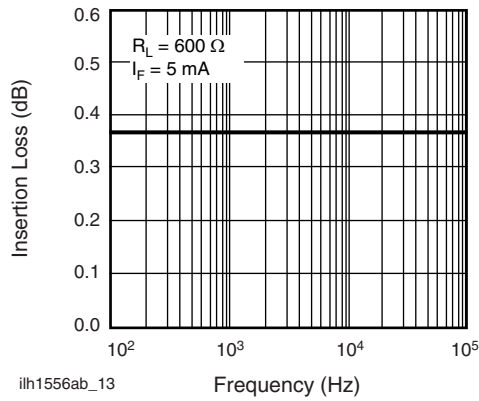


Fig. 14 - Insertion Loss vs. Frequency

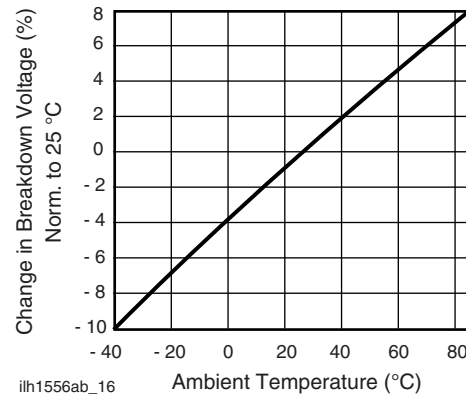


Fig. 17 - Switch Breakdown Voltage vs. Temperature

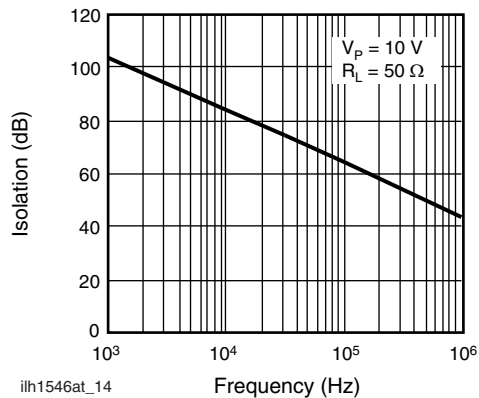


Fig. 15 - Output Isolation

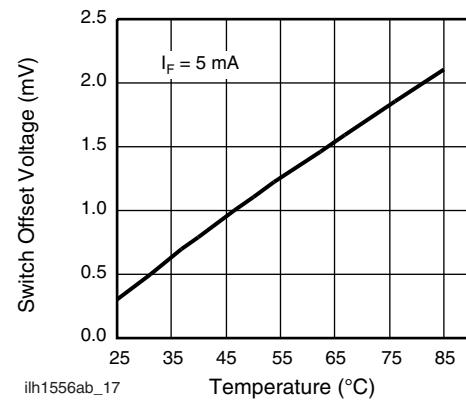


Fig. 18 - Switch Offset Voltage vs. Temperature

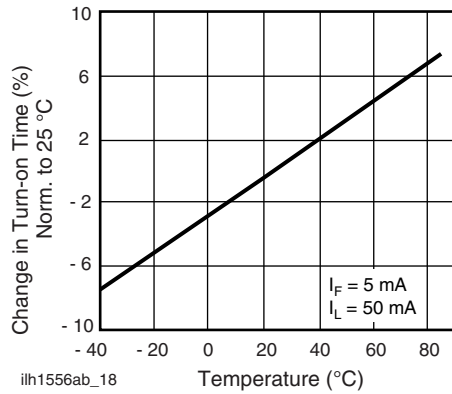


Fig. 19 - Turn-on Time vs. Temperature

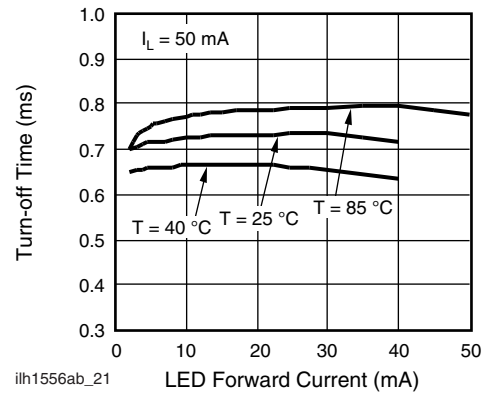


Fig. 22 - Turn-off Time vs. LED Current

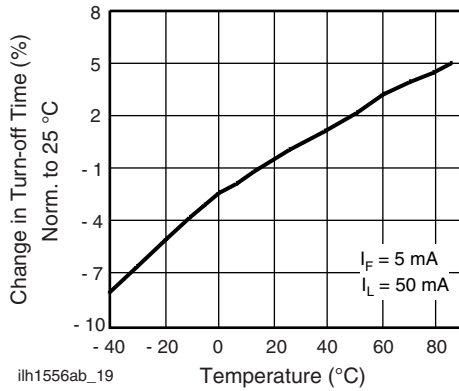


Fig. 20 - Turn-off Time vs. Temperature

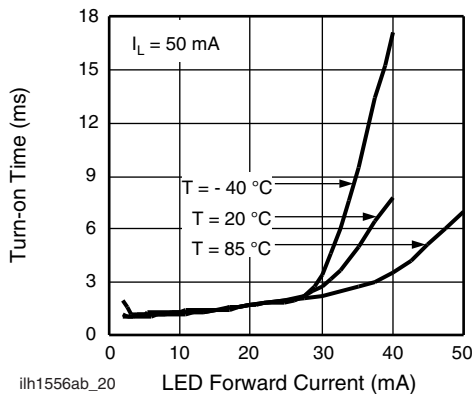
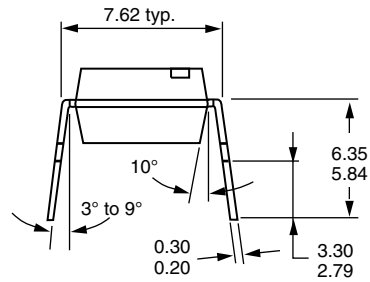
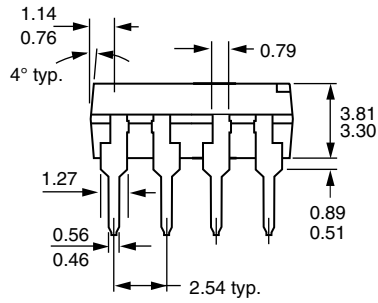
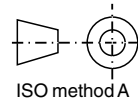
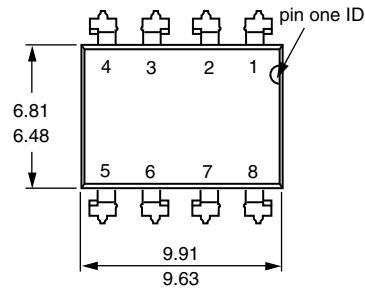


Fig. 21 - Turn-on Time vs. LED Current

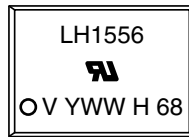
PACKAGE DIMENSIONS in millimeters

DIP



i178008

PACKAGE MARKING (Example)



Note

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



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