

FEATURES

- 5300 V_{RMS} I/O Isolation
- Current-limit Protection Built-in
- Linear ac/dc Operation
- High-reliability Monolithic Receptor
- Low Power Consumption (1.0 mW—12 mW)
- Logic Compatible
- Clean, Bounce-free Switching
- High Surge Capability
- Surface Mountable

AGENCY APPROVALS

- UL – File No. E52744
- CSA – Certification 093751
- BSI/BABT Certified

APPLICATIONS

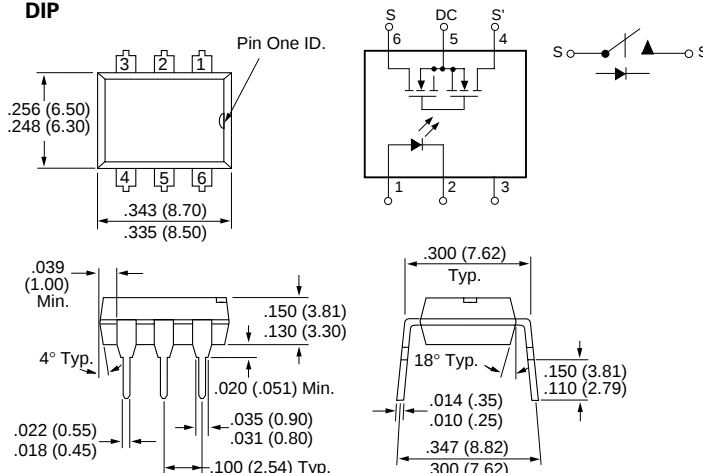
- Telecom Switching
- Programmable Controllers
- Instrumentation
- Industrial Controls
 - Micro Control of Solenoids, Lights, Motors

DESCRIPTION

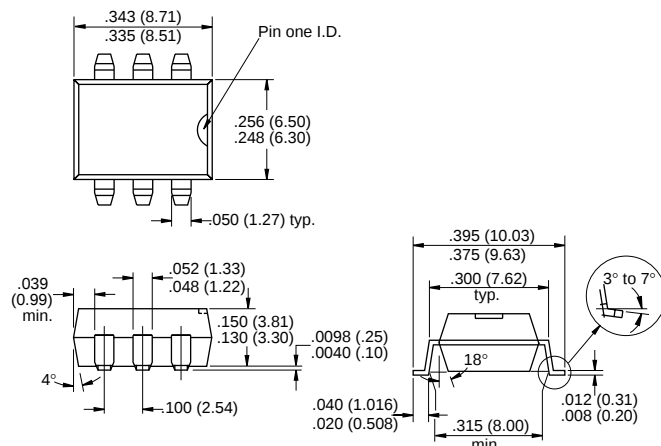
The LH1516 relays are low ON-resistance, SPST normally open switch (1 Form A) that can replace electromechanical relays in many applications. The relays are constructed using a GaAlAs LED for actuation control and an integrated monolithic die for the switch output. The die, fabricated in a high-voltage dielectrically isolated technology, is comprised of a photodiode array, switch-control circuitry, and DMOS switches. In addition, the LH1516 relay employs current-limiting circuitry enabling it to pass FCC 68.302 and other regulatory surge requirements when overvoltage protection is provided. The relays can be configured for ac/dc or dc only operation.

Package Dimensions in Inches (mm)

DIP



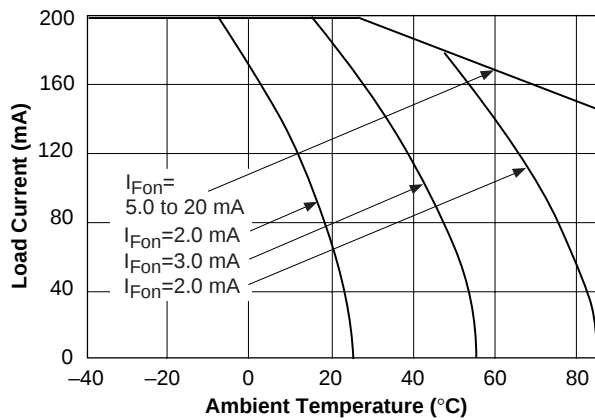
SMD



Part Identification

Part Number	Description
LH1516AT	6-pin DIP, Tubes
LH1516AAB	6-pin SMD, Gullwing, Tubes
LH1516AABTR	6-pin SMD, Gullwing, Tape and Reel

Recommended Operating Conditions



Absolute Maximum Ratings, $T_A = 25^\circ\text{C}$ (except where noted)

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 this document. Exposure to absolute Maximum Ratings for extended periods of time can adversely affect reliability.

Ambient Temperature Range (T_A)	-40 to +85°C
Storage Temperature Range (T_{stg})	-40 to +150°C
Pin Soldering Temperature ($t=10$ s max) (T_S)	260°C
Input/Output Isolation Voltage (V_{ISO})	3750 V_{RMS}
LED Continuous Forward Current (I_F)	50 mA
LED Reverse Voltage ($I_R \leq 10$ μA) (V_R)	8.0 V
DC or Peak AC Load Voltage ($I_L \leq 50$ mA) (V_L)	400 V
Continuous DC Load Current (I_L)	
Bidirectional Operation	240 mA
Unidirectional Operation	450 mA
Peak Load Current ($t=100$ ms) (single shot) (I_P)	†
Output Power Dissipation (continuous) (P_{DISS})	600 mW

† Refer to Current Limit Performance Application Note 58 for a discussion on relay operation during transient currents.

Electrical Characteristics, $T_A = 25^\circ\text{C}$

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, Switch Turn-on	I_{Fon}	—	0.9	2.0	mA	$I_L = 100$ mA, $t = 10$ ms
LED Forward Current, Switch Turn-off	I_{Foff}	0.2	0.8	—	mA	$V_L \pm 350$ V
LED Forward Voltage	V_F	1.15	1.26	1.45	V	$I_F = 10$ mA
Output						
ON-resistance ac/dc: Pin 4 ($\pm$) to 6 ($\pm$) dc: Pin 4, 6 (+) to 5 ($\pm$)	R_{ON}	5.0	7.0	10	Ω	$I_F = 5.0$ mA, $I_L = 50$ mA
		1.25	2.0	2.5		$I_F = 5.0$ mA, $I_L = 100$ mA
OFF-resistance	R_{OFF}	0.5	2500	—	G Ω	$I_F = 0$ mA, $V_L = \pm 100$ V
Current Limit ac/dc: Pin 4 ($\pm$) to 6 ($\pm$) dc: Pin 4, 6 (+) to 5 ($\pm$)	I_{LMT}	290	400	550	mA	$I_F = 5.0$ mA, $t = 5.0$ ms $V_L = \pm 5.0$ V
		—	—	—		$I_F = 5.0$ mA, $V_L = 4.0$ mA $t = 5.0$ ms
Off-state Leakage Current	—	—	0.04	200	nA	$I_F = 0$ mA, $V_L = \pm 100$ V
		—	—	1.0	μA	$I_F = 0$ mA, $V_L = \pm 400$ V
Output Capacitance Pin 4 to 6	—	—	150	—	pF	$I_F = 0$ mA, $V_L = 1.0$ V
		—	30	—		$I_F = 0$ mA, $V_L = 50$ V
Switch Offset	—	—	0.1	—	μV	$I_F = 5.0$ mA
Transfer						
Input/Output Capacitance	C_{ISO}	—	0.8	—	pF	$V_{ISO} = 1.0$ V
Turn-on Time	t_{on}	—	1.1	3.0	ms	$I_F = 5.0$ mA, $I_L = 50$ mA
Turn-off Time	t_{off}	—	0.8	3.0	ms	$I_F = 5.0$ mA, $I_L = 50$ mA

Typical Performance Characteristics

Figure 1. LED Current for Switch Turn-on vs. Temperature

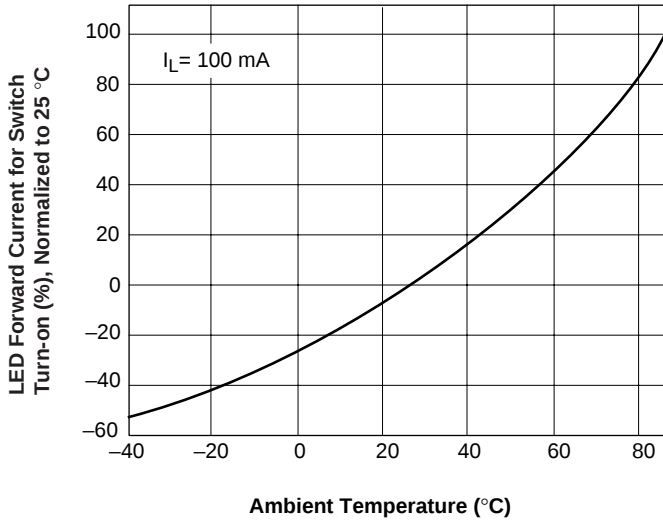


Figure 4. Switch Breakdown Voltage vs. Temperature

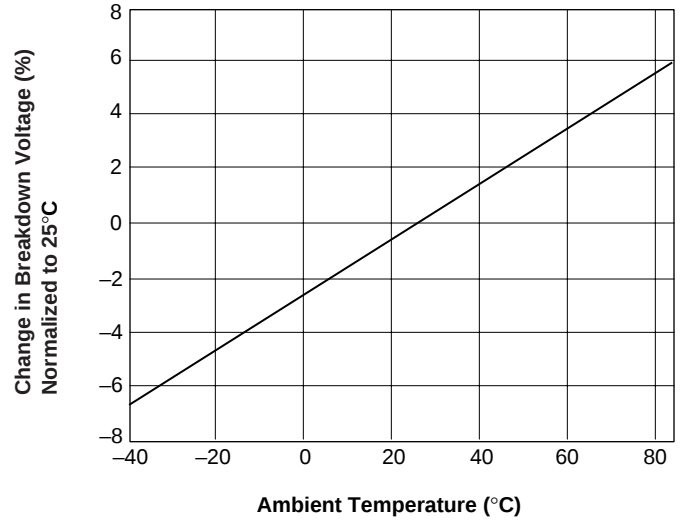


Figure 2. ON-Resistance vs. Temperature

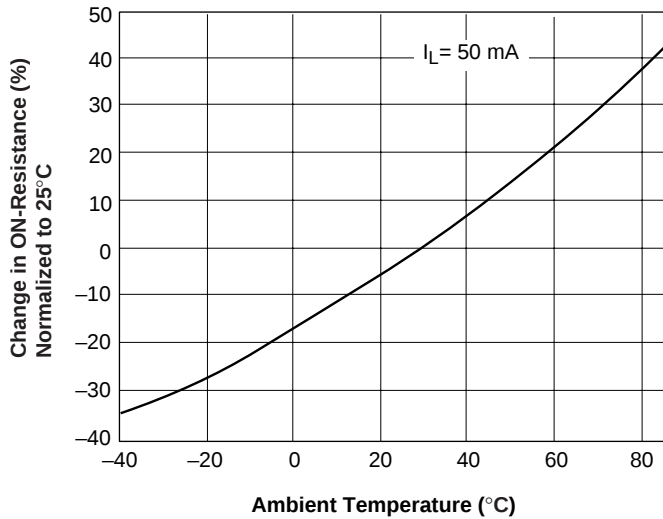


Figure 5. Switch Capacitance vs. Applied Voltage

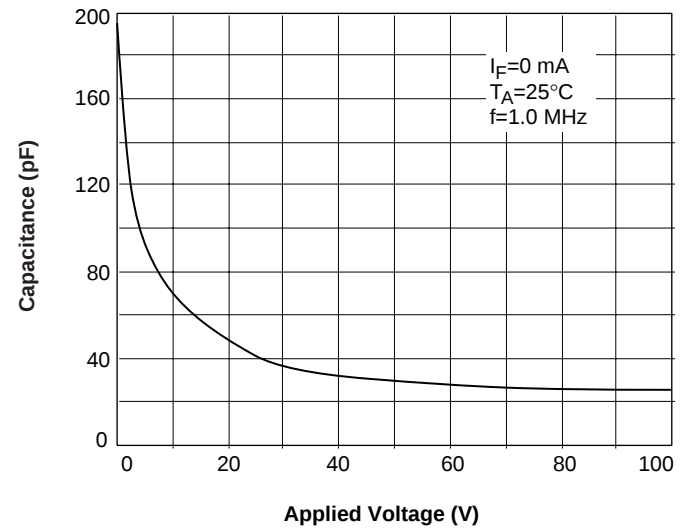


Figure 3. Current Limit vs. Temperature

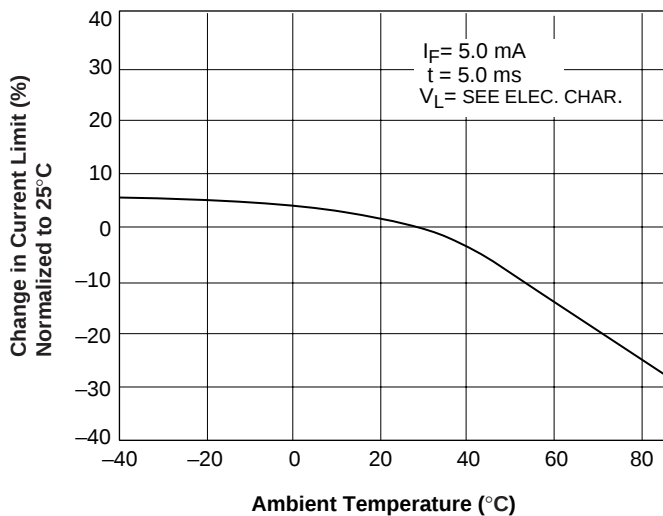


Figure 6. Leakage Current vs. Applied Voltage at Elevated Temperatures

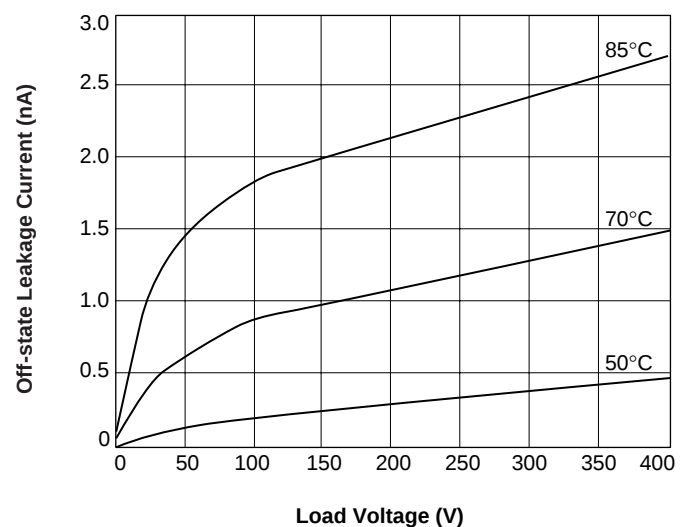


Figure 7. Leakage Current vs. Applied Voltage

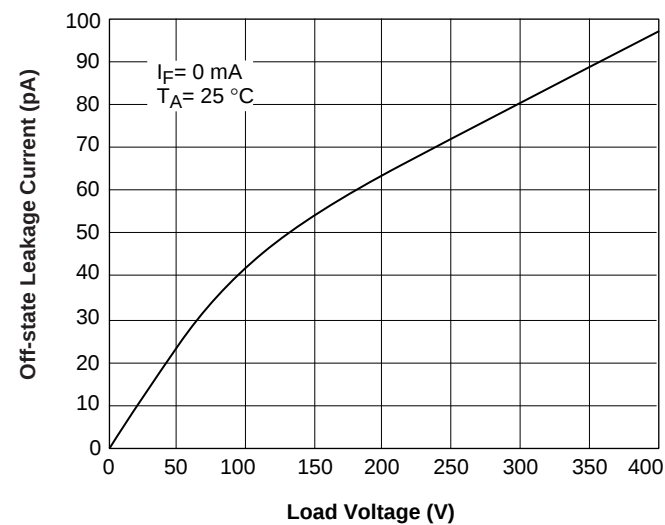


Figure 8. Turn-Off Time vs. Temperature

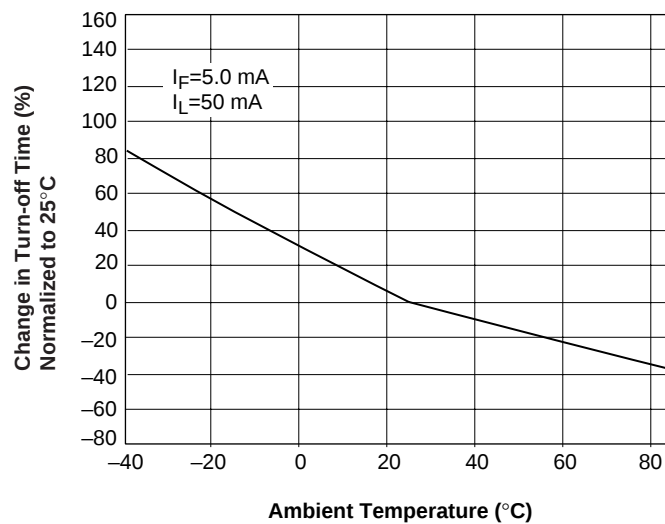


Figure 9. Turn-On Time vs. LED Current

