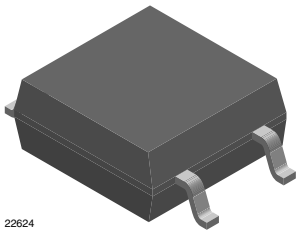
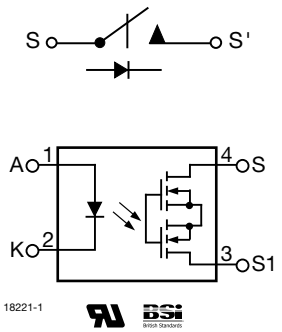
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1 Form A Solid-State Relay





FEATURES

- Current limit protection
- Isolation test voltage 3750 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
- Equivalent to CPC1035N
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free
e3
RoHS COMPLIANT

DESCRIPTION

The LH1546AEF (4 pin SOP) is robust, ideal for telecom and ground fault applications. It is an SPST normally open switch (1 form A) that replaces electromechanical relays in many applications. It is constructed using a GaAs LED for actuation control and MOSFETs for the switch output. In addition, it employs current-limiting circuitry which meets lightning surge testing as per ANSI/TIA-968-B and other regulatory voltage surge requirements when overvoltage protection is provided.

APPLICATIONS

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

Note

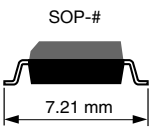
- See “solid-state relays” (application note 56)

AGENCY APPROVALS

- UL1577, file no. E52744 system code O
- BSI/BABT certification no. 8500 issue 2

ORDERING INFORMATION

L	H	1	5	4	6	A	#	#	T	#
PART NUMBER						ELECTR. VARIATION	PACKAGE CONFIG.		TAPE AND REEL	



PACKAGE	UL, BSI
SOP-4, tape and reel (T2 rotation)	LH1546AEFT2
SOP-4, tape and reel	LH1546AEFTR
SOP-4, tubes	LH1546AEF

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ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
INPUT				
LED continuous forward current		I_F	50	mA
LED reverse voltage	$I_R \leq 10$ µA	V_R	6	V
OUTPUT				
DC or peak AC load voltage	$I_L \leq 50$ µA	V_L	350	V
Continuous DC load current at 25 °C, bidirectional		I_L	120	mA
SSR				
SSR output power dissipation (continuous)		P_{diss}	550	mW
Ambient temperature range		T_{amb}	- 40 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 150	°C
Soldering temperature [1]	t = 10 s max.	T_{sld}	260	°C
Isolation test voltage	t = 1 min	V_{ISO}	3750	V_{RMS}
Isolation resistance	V_{IO} = 500 V, T_{amb} = 25 °C	R_{IO}	$\geq 10^{12}$	Ω
	V_{IO} = 500 V, T_{amb} = 100 °C	R_{IO}	$\geq 10^{11}$	Ω

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.

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 = 100 mA, t = 10 ms	I_{Fon}		1.1	2	mA
LED forward current, switch turn-off	V_L = ± 300 V	I_{Foff}	0.2	0.6		mA
LED forward voltage	I_F = 10 mA	V_F	1	1.18	1.45	V
OUTPUT						
On-resistance, AC/DC: pin 3 (±) to 4 (±)	I_F = 5 mA, I_L = 50 mA	R_{ON}		28	35	Ω
Off-resistance	I_F = 0 mA, V_L = ± 100 V	R_{OFF}	0.5	5000		GΩ
Off-state leakage current	I_F = 0 mA, V_L = ± 100 V	I_O		0.32	200	nA
	I_F = 0 mA, V_L = ± 350 V	I_O			1	nA
Output capacitance pin 3 to 4	I_F = 0 mA, V_L = 1 V	C_O		55		pF
	I_F = 0 mA, V_L = 50 V	C_O		10		pF
Current limit	I_F = 5 mA, t = 5 ms, V_L = ± 6 V	I_{limit}	170	210	250	mA
TRANSFER						
Capacitance (input to output)	V_{ISO} = 1 V	C_{IO}		0.6		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 mA, I_L = 50 mA	t_{on}		2	3	ms
Turn-off time	I_F = 5 mA, I_L = 50 mA	t_{off}		0.08	3	ms

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

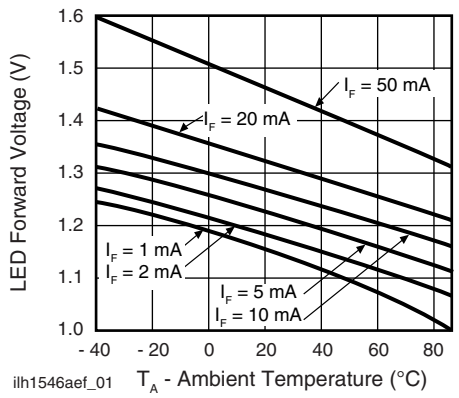


Fig. 1 - LED Voltage vs. Temperature

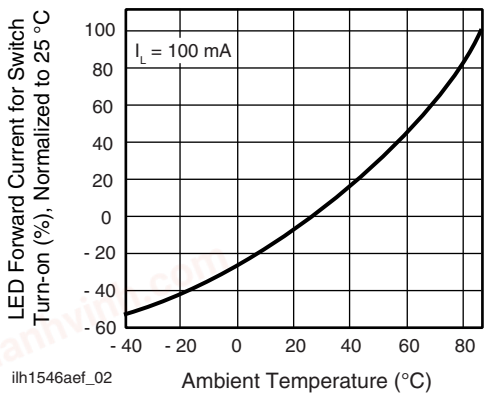


Fig. 2 - LED Current for Switch Turn-on vs. Temperature

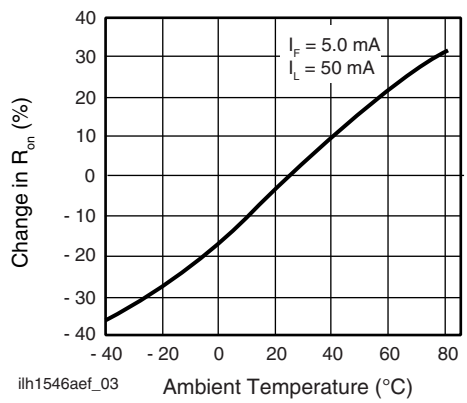


Fig. 3 - On-Resistance vs. Temperature

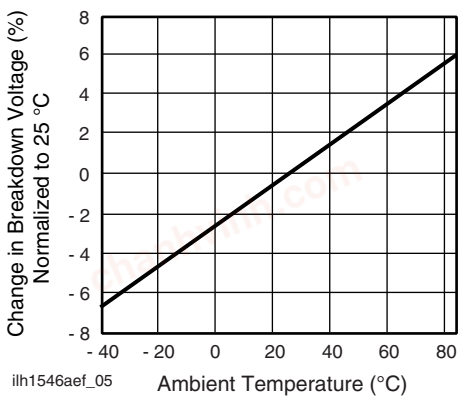


Fig. 4 - Switch Breakdown Voltage vs. Temperature

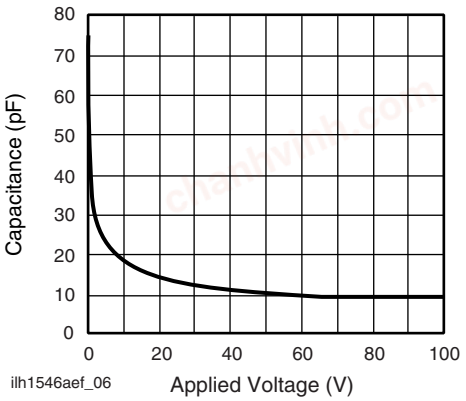


Fig. 5 - Switch Capacitance vs. Applied Voltage

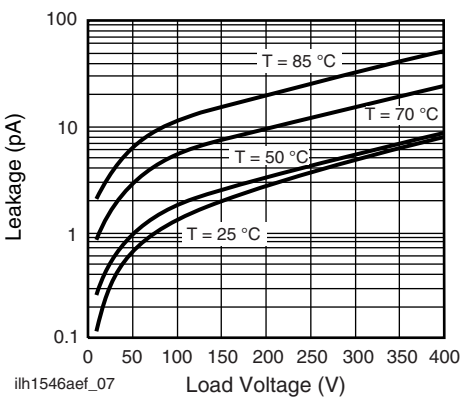


Fig. 6 - Leakage Current vs. Applied Voltage

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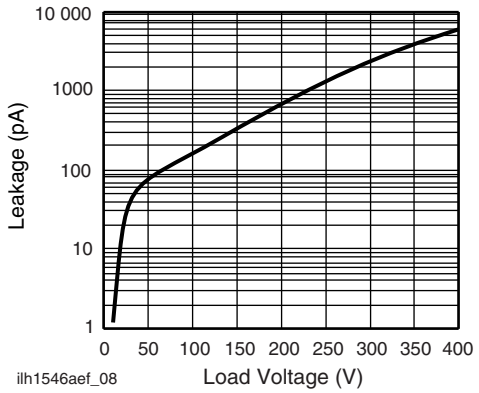


Fig. 7 - Leakage Current vs. Applied Voltage

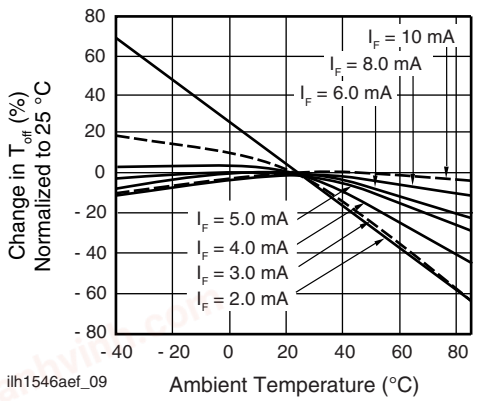


Fig. 8 - Turn-off Time vs. Temperature

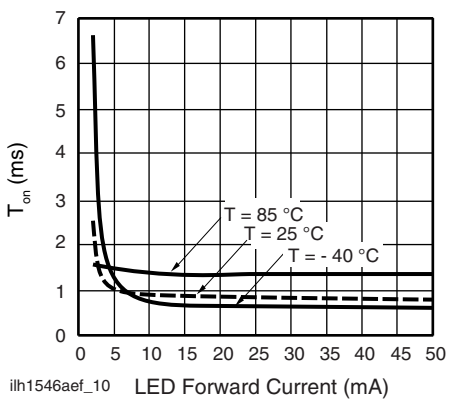
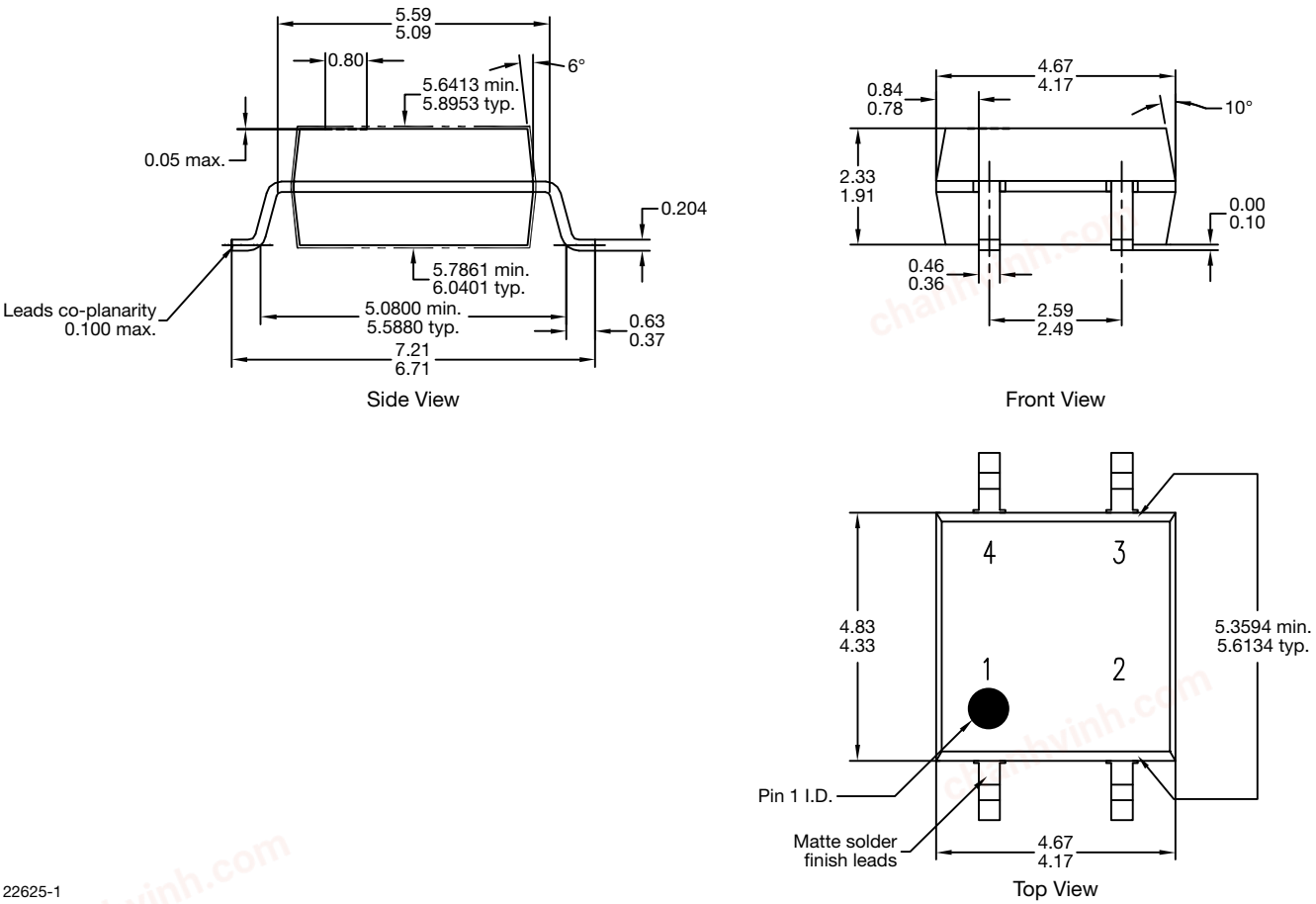


Fig. 9 - Turn-on Time vs. LED Current

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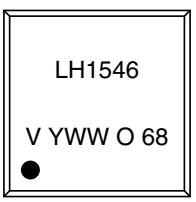
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PACKAGE DIMENSIONS in millimeters



22625-1

PACKAGE MARKING (example)



Note

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

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TAPE ANR REEL DIMENSIONS in millimeters

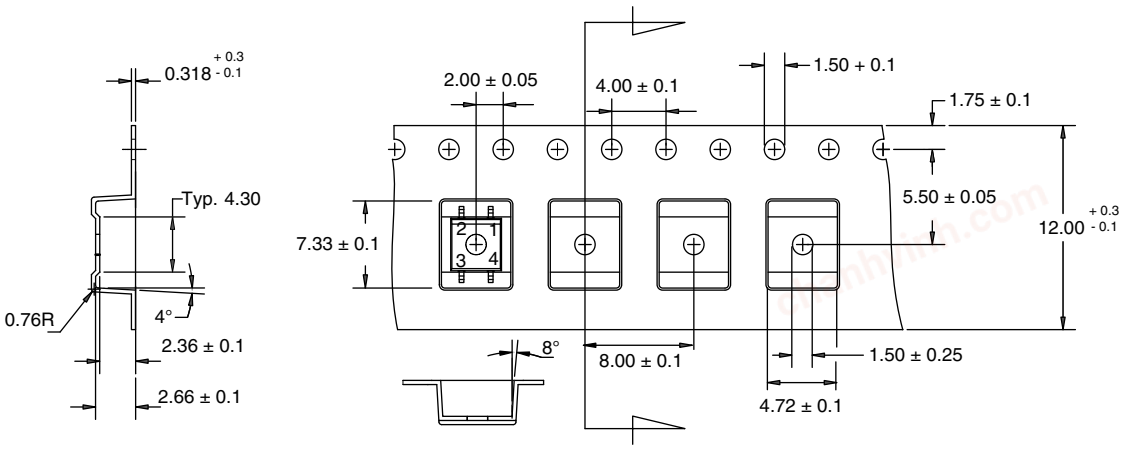


Fig. 10 - LH1546AEFTR, 2000 per Reel

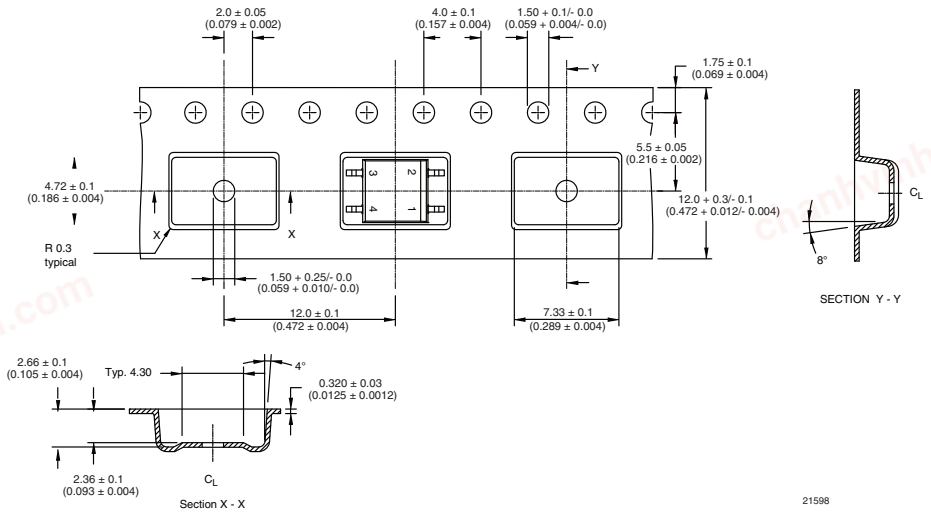


Fig. 11 - LH1546AEFT2, T2 Rotation, 2000 per Reel

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