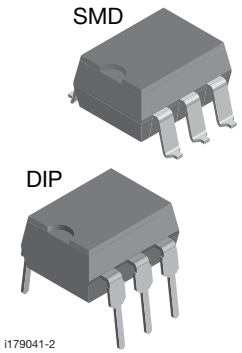
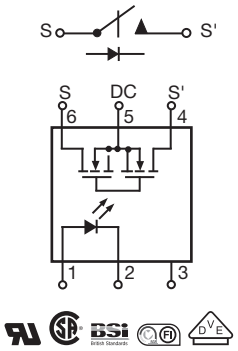
1 Form A Solid State Relay





FEATURES

- Isolation test voltage 5300 V_{RMS}
- Current limit protection
- High reliability monolithic detector
- Low power consumption
- Clean bounce free switching
- High surge capability
- Surface mountable
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e3

RoHS COMPLIANT

DESCRIPTION

Vishay solid state relays (SSRs) are miniature, optically coupled relays with high-voltage MOSFET outputs. The LH1518 relays are capable of switching AC or DC loads from as little as nanovolts to hundreds of volts.

The relays can switch currents in the range of nanoamps to hundreds of milliamps. The MOSFET switches are ideal for small signal switching and are primarily suited for DC or audio frequency applications.

The LH1518 relays feature a monolithic output die that minimizes wire bonds and permits easy integration of high-performance circuits such as current limiting in normally-open switches. The output die integrates the photodiode receptor array, turn-on and turn-off control circuitry, and the MOSFET switches. The optically-coupled input is controlled by a highly efficient GaAlAs infrared LED.

APPLICATIONS

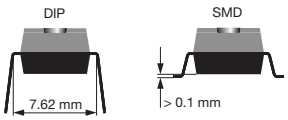
- General telecom switching
- Instrumentation
- Industrial controls

AGENCY APPROVALS

UL1577: file no. E52744 system code H, double protection
CSA: certification no. 093751
BSI: certification no. 7979/7980
DIN EN: 60747-5-2 (VDE 0884)/60747-5-5 (pending), available with option 1
FIMKO: 25419

ORDERING INFORMATION

L	H	1	5	1	8	#	#	#	T	R
PART NUMBER						ELECTR. VARIATION	PACKAGE CONFIG.		TAPE AND REEL	



PACKAGE	UL, CSA, BSI, FIMKO
SMD-6, tubes	LH1518AAB
SMD-6, tape and reel	LH1518AABTR
DIP-6, tubes	LH1518AT

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	8	V
OUTPUT				
DC or peak AC load voltage		V_L	250	V
Continuous DC load current, bidirektional operation		I_L	155	mA
Continuous DC load current, unidirektional operation		I_L	300	mA
Peak load current (single shot)	t = 100 ms	I_P	(1)	

This datasheet is subject to change without notice.
THE PRODUCT DESCRIBED HEREIN AND THIS DATASHEET ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
SSR				
Ambient temperature range		T_{amb}	- 40 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 150	°C
Pin soldering temperature [2]	t = 10 s max.	T_{sld}	260	°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 58 for a discussion on relay operation during transient currents.

(2) 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 = 100 mA, t = 10 ms	I_{Fon}		0.8	2	mA
LED forward current switch turn-off	V_L = ± 200 V	I_{Foff}	0.2	0.7		mA
LED forward voltage	I_F = 10 mA	V_F	1.15	1.26	1.45	V
OUTPUT						
On-resistance AC/DC: pin 4 (±) to 6 (±)	I_F = 5 mA, I_L = 50 mA	R_{ON}	10	15	20	Ω
Off-resistance DC: pin 4, 6 (+) to 5 (±)	I_F = 5 mA, I_L = 100 mA	R_{ON}	2.5	3.75	5	Ω
Off-resistance	I_F = 0 mA, V_L = ± 100 V	R_{OFF}	0.5	5000		GΩ
Current limit AC [1]: pin 4 (±) to 6 (±)	I_F = 5 mA, t = 5 ms, V_L = ± 6 V	I_{LMT}	170	200	280	mA
Off-state leakage current	I_F = 0 mA, V_L = ± 100 V	I_O		0.02	200	nA
	I_F = 0 mA, V_L = ± 250 V	I_O			1	µA
Output capacitance pin 4 to 6	I_F = 0 mA, V_L = 1 V	C_O		55		pF
	I_F = 0 mA, V_L = 50 V	C_O		10		pF
Switch offset	I_F = 5 mA	V_{OS}		0.15		µV
TRANSFER						
Capacitance (input to output)	V_{ISO} = 1 V	C_{IO}		0.8		pF

Notes

- 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.

(1) No DC mode current limit available.

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}		1.4	3	ms
Turn-off time	I_F = 5 mA, I_L = 50 mA	t_{off}		0.7	3	ms

This datasheet is subject to change without notice.
THE PRODUCT DESCRIBED HEREIN AND THIS DATASHEET ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

SAFETY AND INSULATION RATINGS					
PARAMETER		**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Climatic classification		IEC 68 part 1		40/85/21	
Pollution degree		DIN VDE 0109		2	
Tracking resistance (comparative tracking index)		Insulation group IIIa	CTI	175	
Highest allowable overvoltage		Transient overvoltage	V_{IOTM}	8000	V_{peak}
Max. working insulation voltage		Recurring peak voltage	V_{IORM}	890	V_{peak}
Insulation resistance at 25 °C		V_{IO} = 500 V	R_{IS}	$\geq 10^{12}$	Ω
Insulation resistance at T_S			R_{IS}	$\geq 10^{9}$	Ω
Insulation resistance at 100 °C			R_{IS}	$\geq 10^{11}$	Ω
Partial discharge test voltage		Methode a, $V_{pd} = V_{IORM}$ x 1.875	V_{pd}	1669	V_{peak}
Safety limiting values - maximum values allowed in the event of a failure	Case temperature		T_{SI}	175	°C
	Input current		I_{SI}	300	mA
	Output power		P_{SO}	700	mW
Minimum external air gap (clearance)		Measured from input terminals to output terminals, shortest distance through air		≥ 7	mm
Minimum external tracking (creepage)		Measured from input terminals to output terminals, shortest distance path along body		≥ 7	mm

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

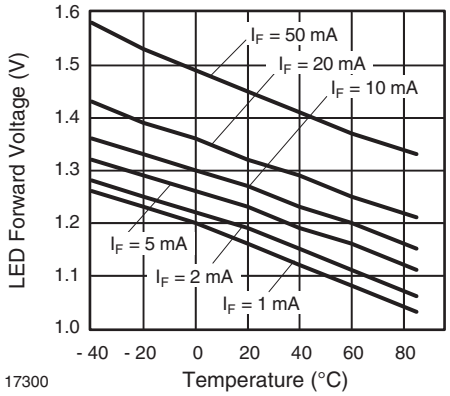


Fig. 1 - LED Voltage vs. Temperature

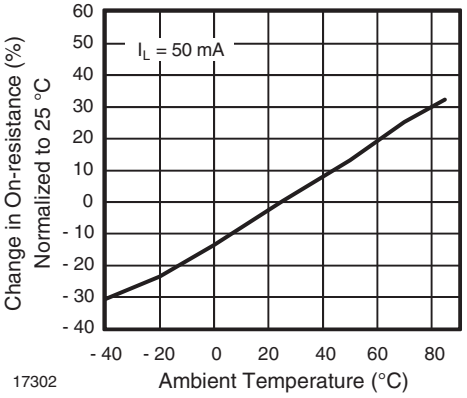


Fig. 3 - On-resistance vs. Temperature

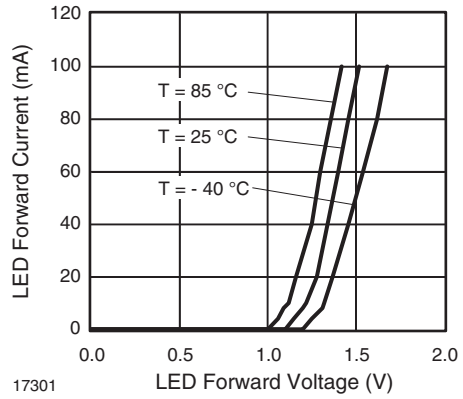


Fig. 2 - LED Forward Current vs. LED Forward Voltage

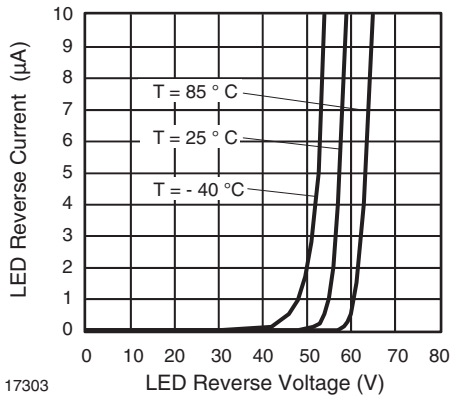


Fig. 4 - LED Reverse Current vs. LED Reverse Voltage

This datasheet is subject to change without notice.
THE PRODUCT DESCRIBED HEREIN AND THIS DATASHEET ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

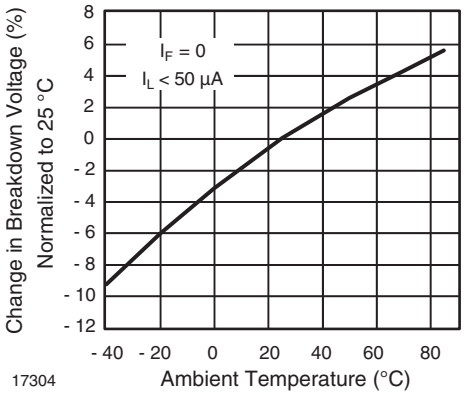


Fig. 5 - Switch Breakdown Voltage vs. Temperature

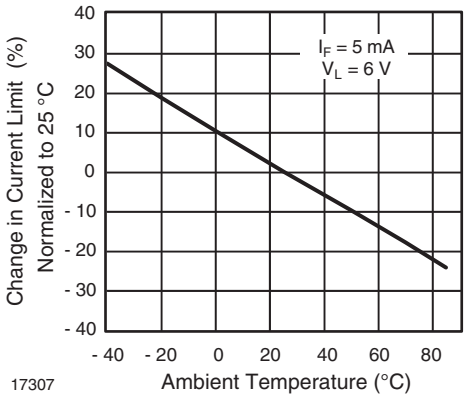


Fig. 8 - Current Limit vs. Temperature

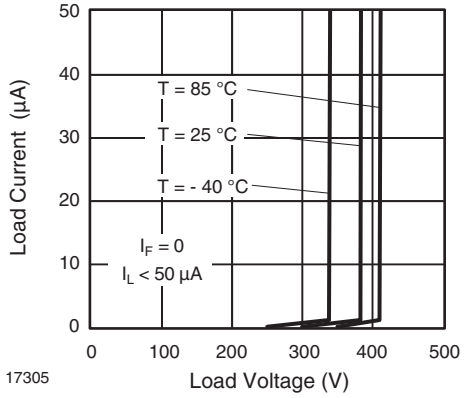


Fig. 6 - Switch Breakdown Voltage vs. Load Current

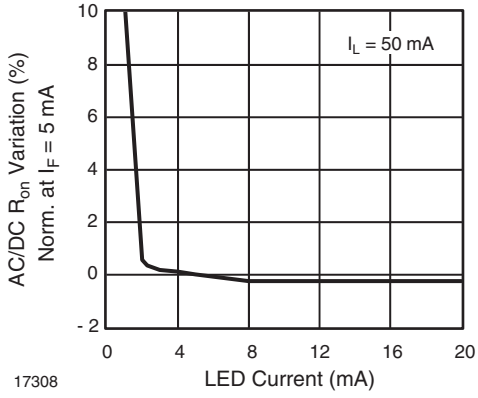


Fig. 9 - Variation in On-resistance vs. LED Current

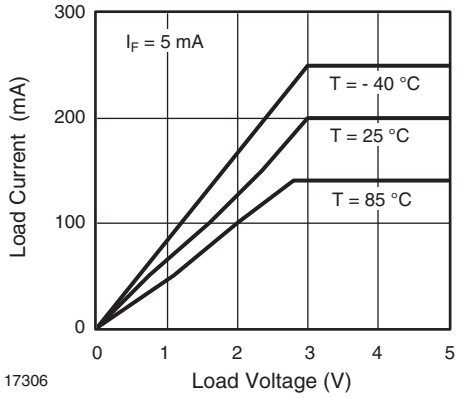


Fig. 7 - Load Current vs. Load Voltage

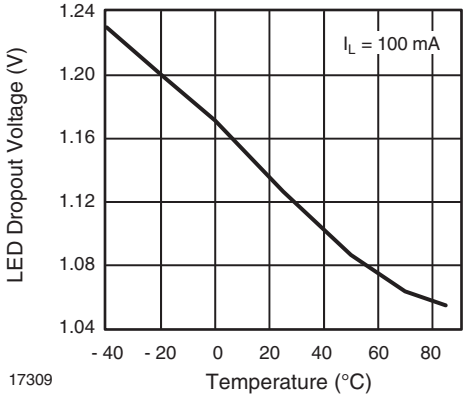


Fig. 10 - LED Dropout Voltage vs. Temperature

This datasheet is subject to change without notice.
THE PRODUCT DESCRIBED HEREIN AND THIS DATASHEET ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

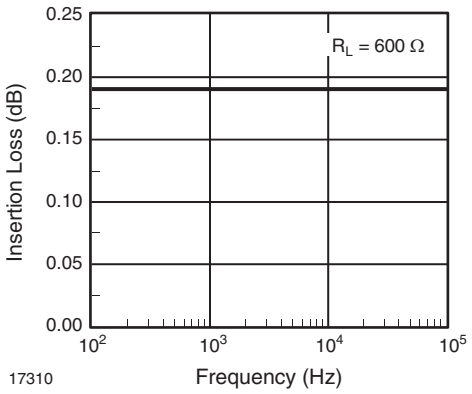


Fig. 11 - Insertion Loss vs. Frequency

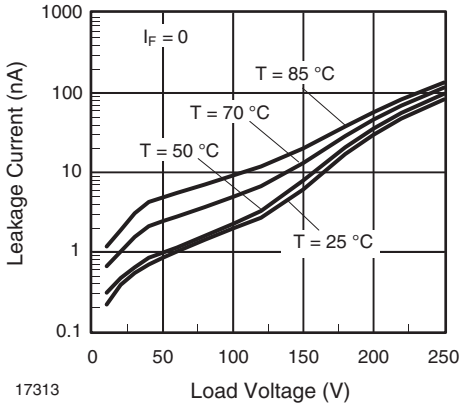


Fig. 14 - Leakage Current vs. Applied Voltage

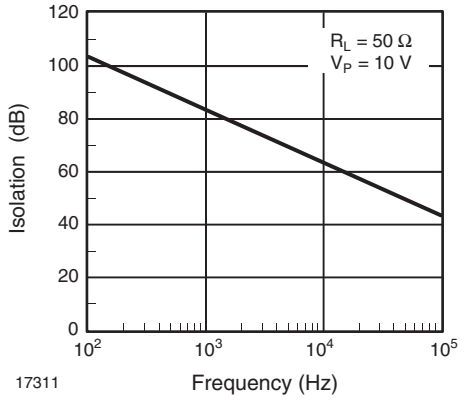


Fig. 12 - Output Isolation

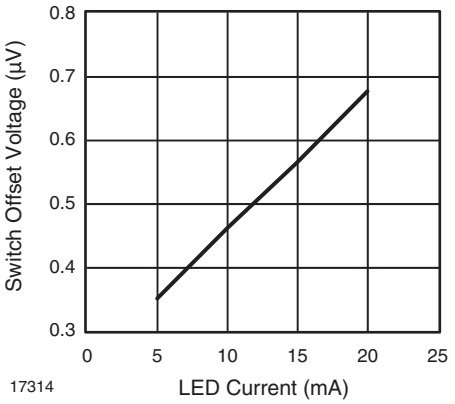


Fig. 15 - Switch Offset Voltage vs. LED Current

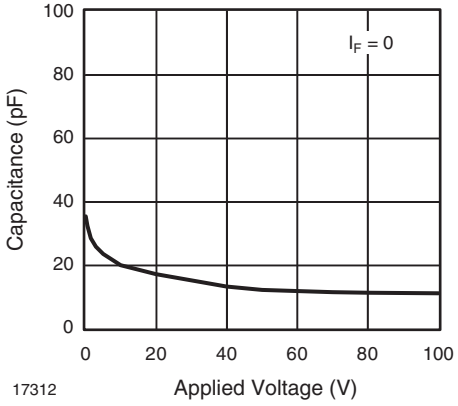


Fig. 13 - Switch Capacitance vs. Applied Voltage

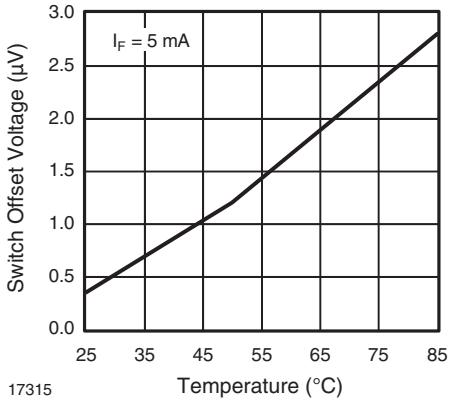


Fig. 16 - Switch Offset Voltage vs. Temperature

This datasheet is subject to change without notice.
THE PRODUCT DESCRIBED HEREIN AND THIS DATASHEET ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

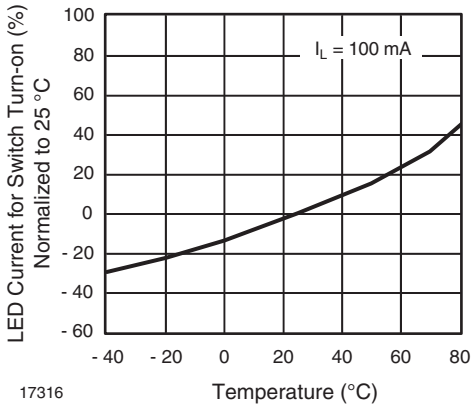


Fig. 17 - LED Current for Switch Turn-on vs. Temperature

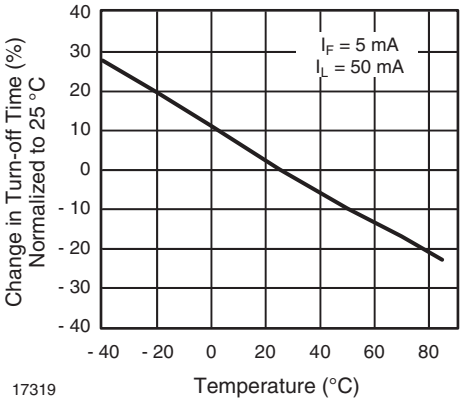


Fig. 20 - Turn-off Time vs. Temperature

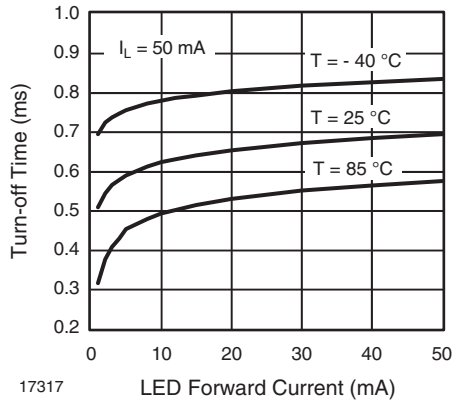


Fig. 18 - Turn-off Time vs. LED Current

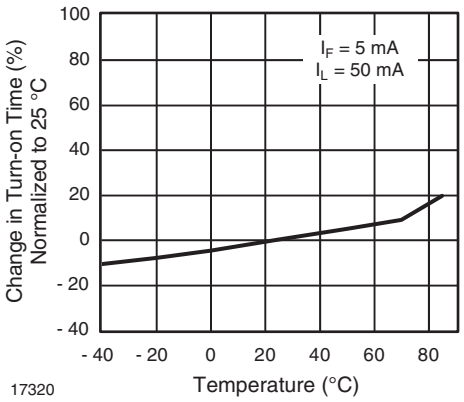


Fig. 21 - Turn-on Time vs. Temperature

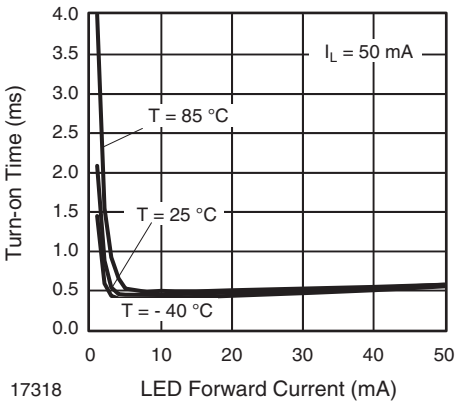
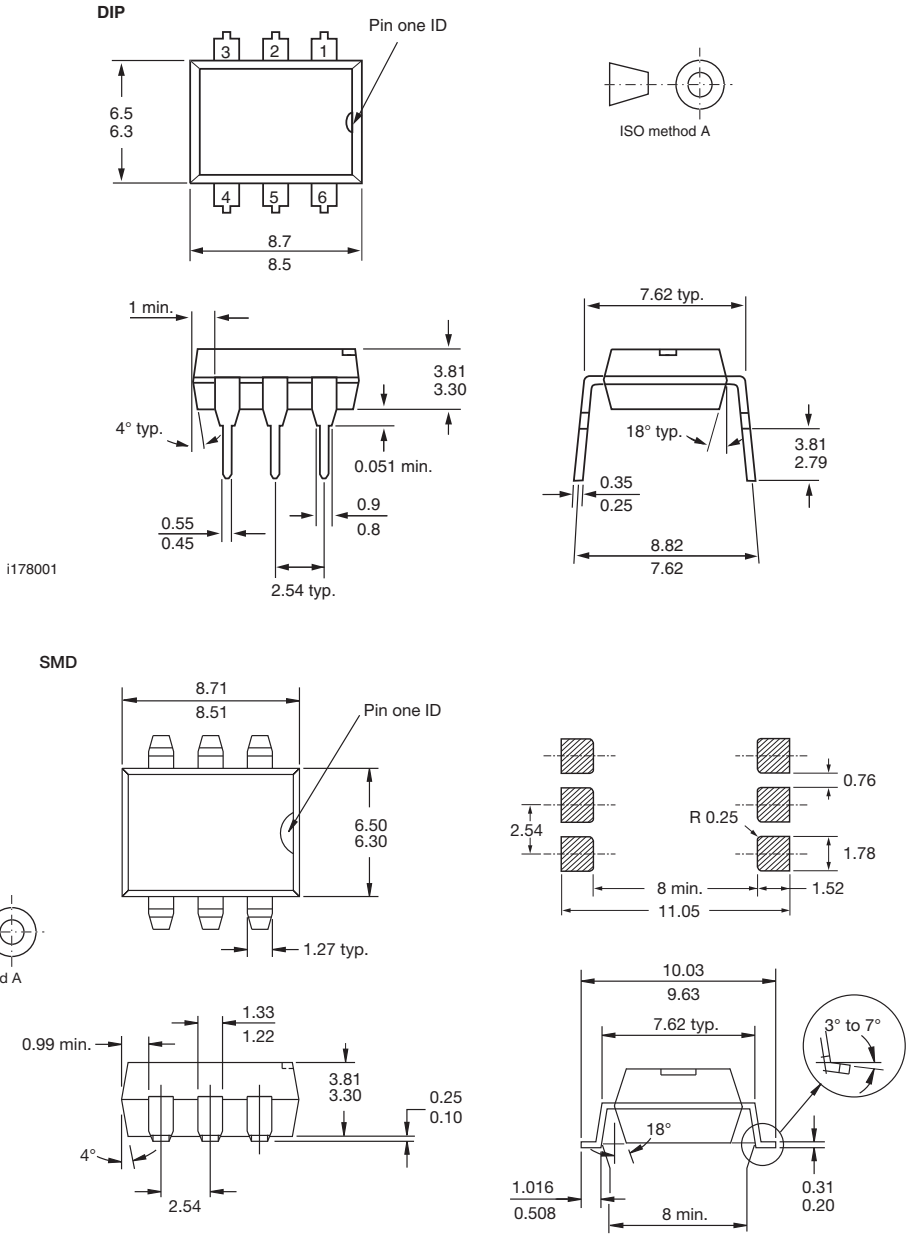


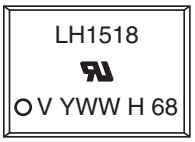
Fig. 19 - Turn-on Time vs. LED Current

This datasheet is subject to change without notice.
THE PRODUCT DESCRIBED HEREIN AND THIS DATASHEET ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

PACKAGE DIMENSIONS in millimeters



PACKAGE MARKING



Note

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

This datasheet is subject to change without notice.
THE PRODUCT DESCRIBED HEREIN AND THIS DATASHEET ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9