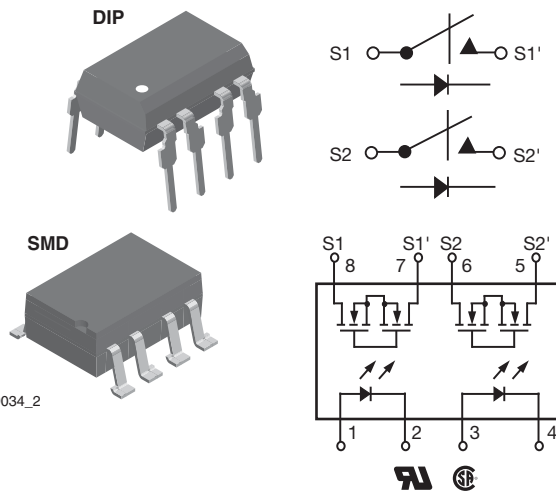


## Dual 1 Form A Solid-State Relay



i179034\_2



RoHS COMPLIANT

### FEATURES

- Dual channel (LH1546)
- Current limit protection
- Isolation test voltage 5300 V<sub>RMS</sub>
- Typical R<sub>ON</sub> 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
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

### 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

ORDERING INFORMATION												
L	H	1	5	5	6	A	#	#	T	R	DIP	SMD
PART NUMBER						ELECTR. VARIATION	PACKAGE CONFIG.		TAPE AND REEL		7.62 mm	> 0.1 mm
<b>PACKAGE</b>						<b>UL, CSA</b>						
SMD-8, tubes						LH1556AAC						
SMD-8, tape and reel						LH1556AACTR						
DIP-8, tubes						LH1556AB						



ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>INPUT</b>				
LED continuous forward current		$I_F$	50	mA
LED reverse voltage	$I_R \leq 10\text{ }\mu\text{A}$	$V_R$	8.0	V
<b>OUTPUT</b>				
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
<b>SSR</b>				
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.

(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 ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>INPUT</b>						
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
<b>OUTPUT</b>						
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	$\Omega$
On-resistance DC: pin 4, 6 (+) to 5 (-)	$I_F = 5.0\text{ mA}$ , $I_L = 100\text{ mA}$	$R_{ON}$		7.0	10	$\Omega$
Off-resistance	$I_F = 0\text{ mA}$ , $V_L = \pm 100\text{ V}$	$R_{OFF}$	0.5	300		$G\Omega$
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	$\mu\text{A}$
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		$\mu\text{V}$
<b>TRANSFER</b>						
Capacitance (input to output)	$V_{ISO} = 1.0\text{ V}$	$C_{IO}$		0.67		pF

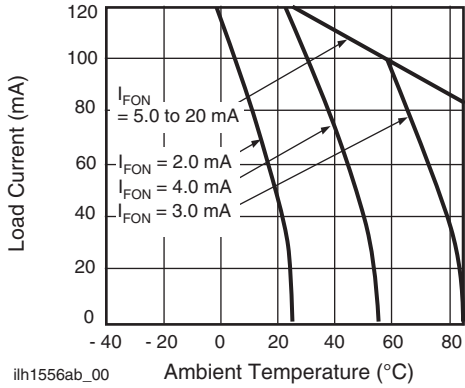
**Note**

- 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

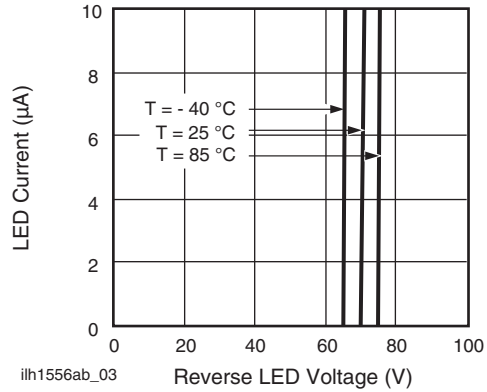


## TYPICAL CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)



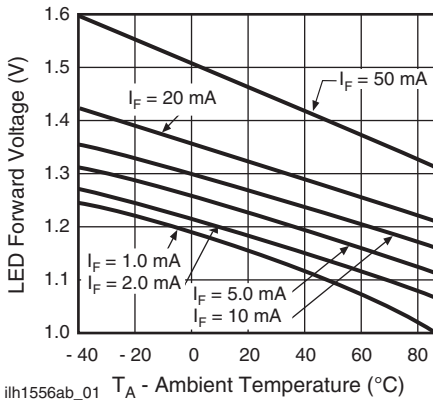
ilh1556ab\_00

Fig. 1 - Recommended Operating Conditions



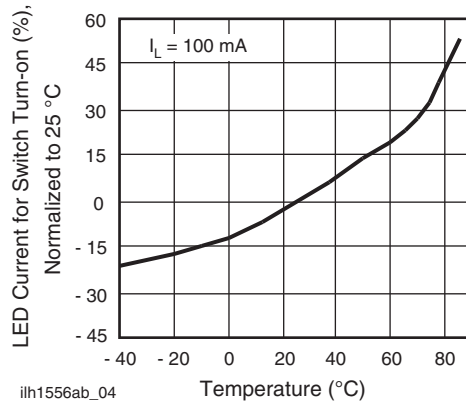
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Fig. 4 - LED Reverse Current vs. LED Reverse Voltage



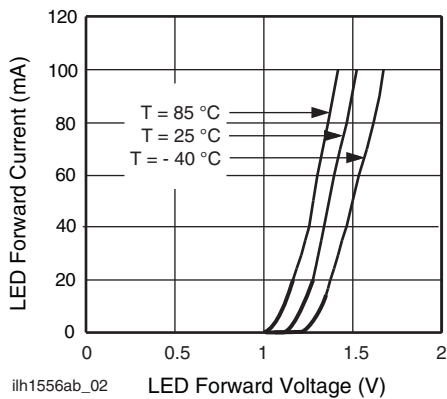
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Fig. 2 - LED Voltage vs. Temperature



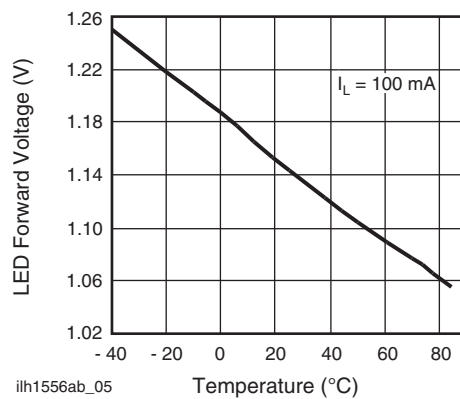
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Fig. 5 - LED Current for Switch Turn-on vs. Temperature



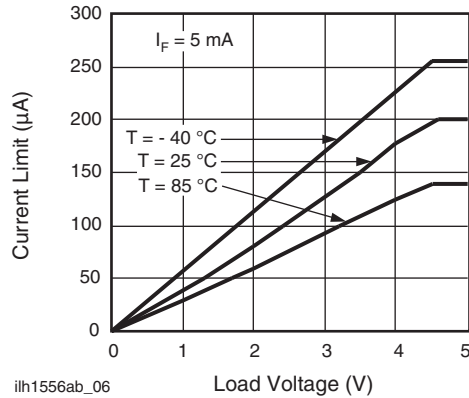
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Fig. 3 - LED Forward Current vs. LED Forward Voltage



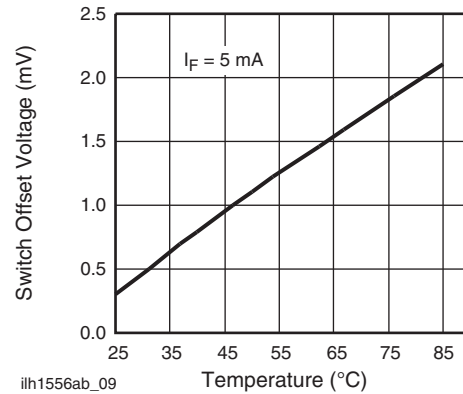
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Fig. 6 - LED Dropout Voltage vs. Temperature



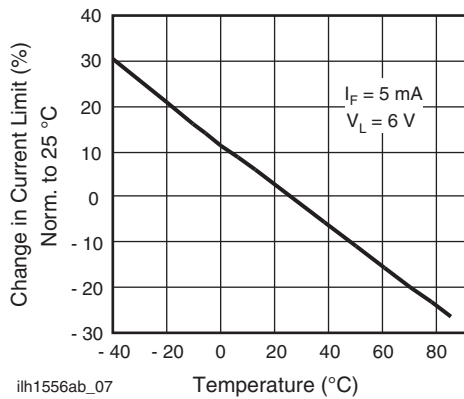
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Fig. 7 - Load Current vs. Load Voltage



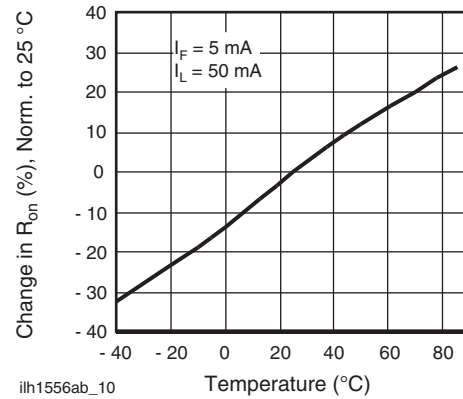
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Fig. 10 - Switch Offset Voltage vs. LED Current



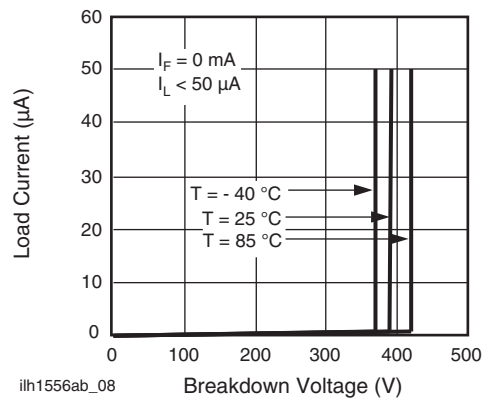
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Fig. 8 - Current Limit vs. Temperature



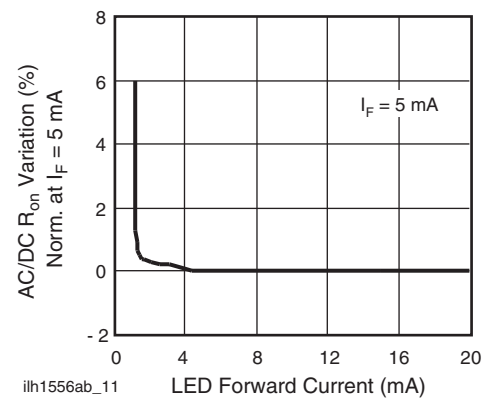
ih1556ab\_10

Fig. 11 - On-Resistance vs. Temperature



ih1556ab\_08

Fig. 9 - Switch Breakdown Voltage vs. Load Current



ih1556ab\_11

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

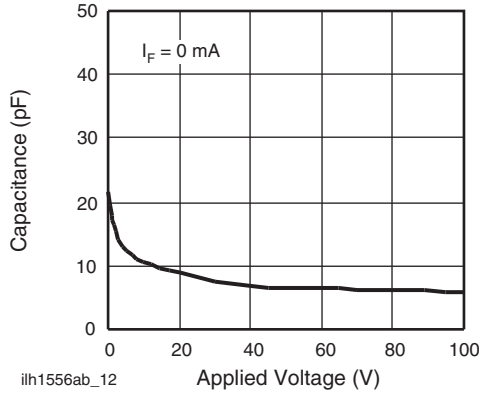


Fig. 13 - Switch Capacitance vs. Applied Voltage

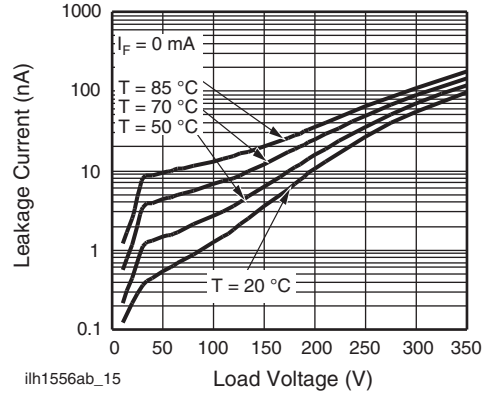


Fig. 16 - Leakage Current vs. Applied Voltage at Elevated Temperatures

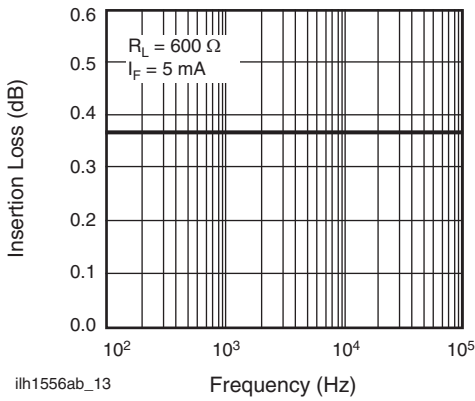


Fig. 14 - Insertion Loss vs. Frequency

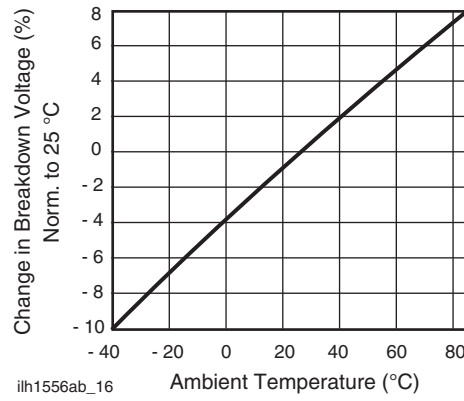


Fig. 17 - Switch Breakdown Voltage vs. Temperature

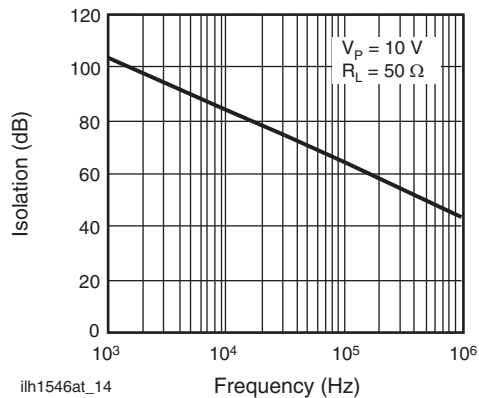


Fig. 15 - Output Isolation

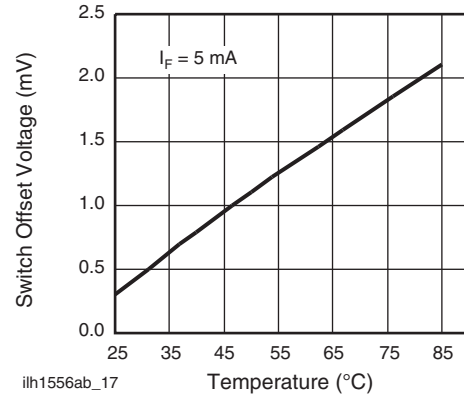


Fig. 18 - Switch Offset Voltage vs. Temperature

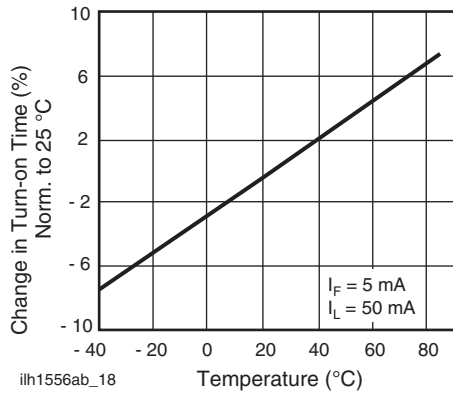


Fig. 19 - Turn-on Time vs. Temperature

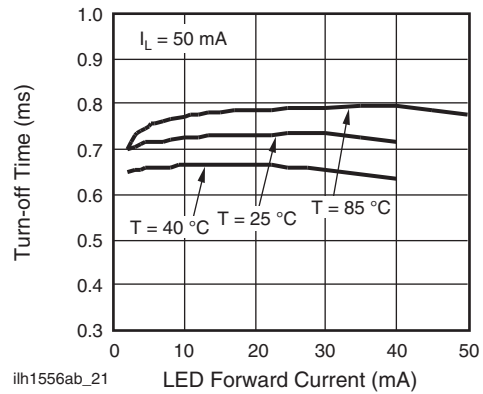


Fig. 22 - Turn-off Time vs. LED Current

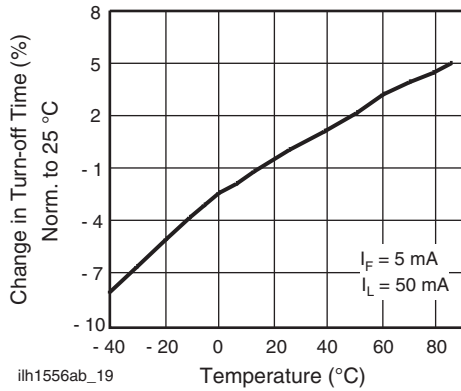


Fig. 20 - Turn-off Time vs. Temperature

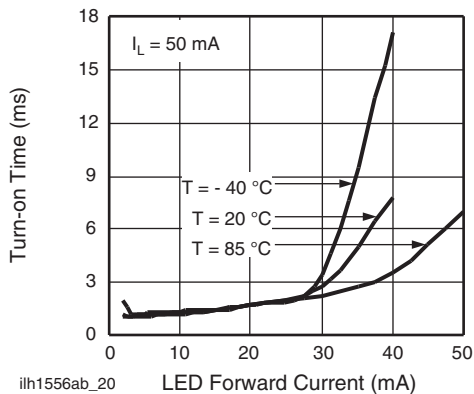
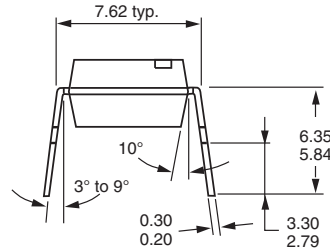
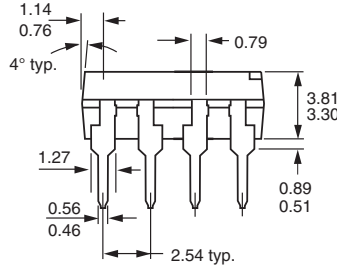
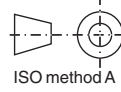
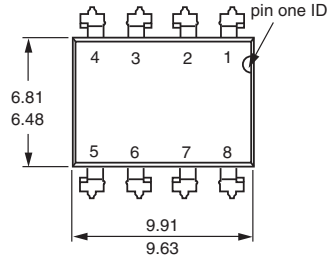


Fig. 21 - Turn-on Time vs. LED Current



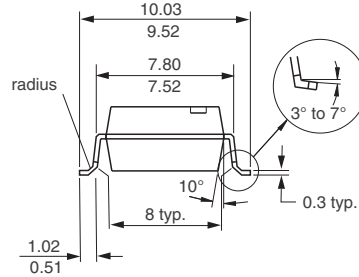
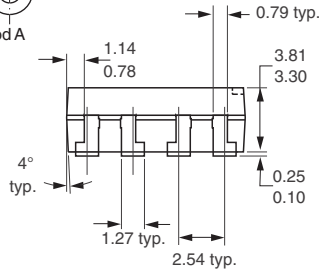
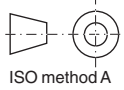
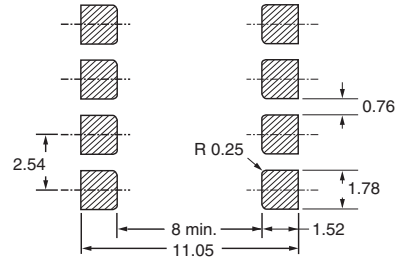
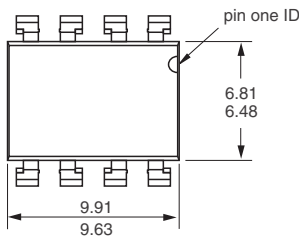
## PACKAGE DIMENSIONS in millimeters

DIP



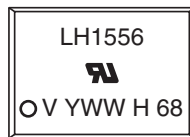
i178008

SMD



i178009

## PACKAGE MARKING (example)



### Note

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



## Disclaimer

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