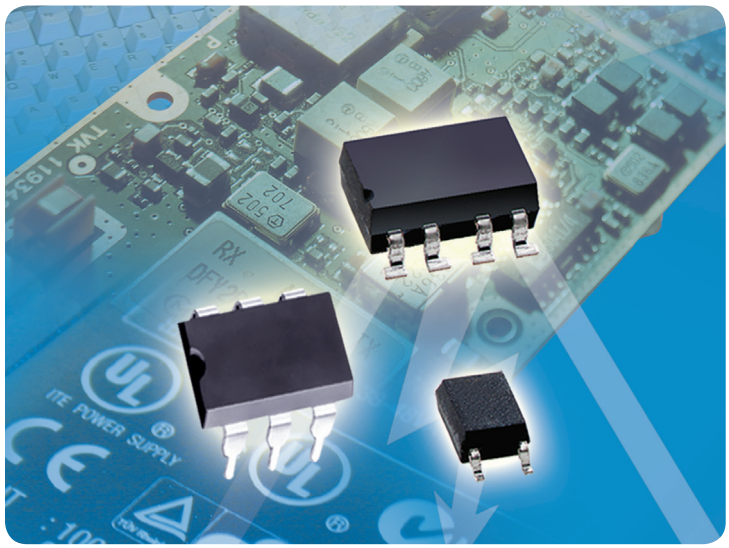
OPTOCOUPLER SOLID STATE RELAYS

Solid State Relays



INTRODUCTION

Vishay's solid-state relays (SSRs) deliver fast switching while optically isolating and protecting equipment from damaging external high-voltage spikes. By eliminating the majority of wire bonds found in other SSRs, Vishay's monolithic structure has set the performance standard.

With no moving parts, our SSRs relays are noiseless, bounce-free and reliable, commonly replacing electromechanical relays. Used in industrial, automotive, and communication applications, all of our SSRs feature low power consumption, small packaging, and low turn-on current. Exceeding industry standards, they are approved by VDE, UL, CSA and other safety regulatory agencies.

FEATURES

- Reliable, long life, no noise, contact bounce or arcing
- Low power consumption at 75 % lower than EMR
- Low capacitance SSRs (3.5 pF)
- High-frequency SSRs (< 50 mhz)

APPLICATIONS

- Motor drive controls
- AC/DC power inverters
- PCMCIA
- Modems
- Desktop PCs and servers

RESOURCES

- Datasheets: http://www.vishay.com/solid-state-relays/
- SSR application notes: http://www.vishay.com/solid-state-relays/related/#appnot
- Optocoupler product portfolio: http://www.vishay.com/optocouplers/
- Technical support: optocoupleranswers@vishay.com
- Sales contacts: http://www.vishay.com/doc?99914

OPTOCOUPLER SOLID STATE RELAYS

Part Number Coding

VO1400 A EF TR
LH1550 A AC 1

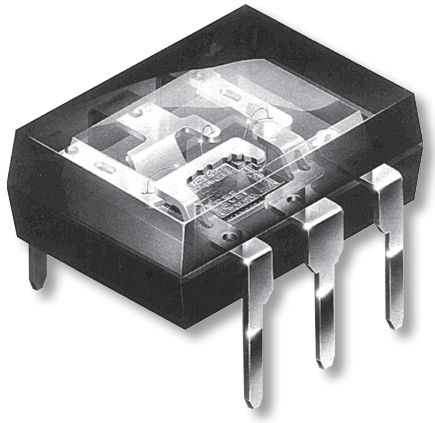
- TR = packaged in tape and reel configuration
- 1 = No DC contact for 6-pin package, at Pin 5

Package Configuration
1 or 2 Alpha Suffix designator
- B = 8-pin DIP
- D = 4-pin DIP
- T = 6-pin DIP
- AB = 6-pin Gull Wing
- AC = 8-pin Gull Wing
- CC = 8-pin "S" Bend Gull Wing
- CD = 8-pin SOP
- EF = 4-pin SOP
- DF = 4-pin Gull Wing

Electrical Variation
- A = No variation from test specification
- B,C, etc. = Test specification variation

Device Identifier

www.vishay.com/ref/solid_state_relays



FAQs

1. What are the advantages of SSRs over electromechanical relays (EMRs)?
Reliablity, long life; no noise, contact bounce or arcing, and low power consumption (75 % lower than EMR).

2. Do you have a low-cost SSR for use in place of EMRs? The 4-pin LH1546AEF/AD can be used, depending on your application requirements. Other possibilities include the LH1532FP and LH1550 products.

3. Can your SSRs meet my project's requirement for an I/O voltage of at least 2500 V to 3000 V?
Most of our SSRs provide an I/O voltage of 5300 V.

4. Do you have high speed MOSFET drivers?
Yes, we have the LH1262 and VO1263 which can be configured for best use in motor drive controls, IGBT predrivers, and AC/DC power inverters. It can also be used to customize and build your own custom SSR.

5. How do I know which agency approvals are available?
All SSRs are Underwriters Laboratories (UL) recognized. Most have Canadian Standards Association (CSA), FIMKO IEC 950 EN60950 and VDE 0884 certifications. See our website for product-specific information.

OPTOCOUPLER SOLID STATE RELAYS

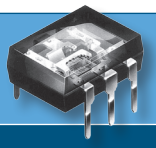
Output Characteristics

	Description		Load Voltage Max. (V)	Load Current Max. Recommended (mA)		On-Resistance Max. at 25 °C (Ω)		Current Limit (mA) Typ. at 25 °C I_F = 5 mA	Switching Time (msec) Max. at 25 °C I_F = 5 mA	
Relay Type	**Package**	**Pins**		**AC/DC**	**DC**	**AC/DC**	**DC**	**AC/DC**	**t_{on}**	**t_{off}**
LH1546[5]	1 Form A	4	350	120	—	35	—	—	3.0	3.0
VO1400AEFTR[5]			60	100	—	5	—	—	0.5	0.5
LH1510[9]	1 Form A	6	200	200	350	15	3.75	360	2.0*	2.0*
LH1518			250	155	300	20	5	280[10]	3.0	3.0
LH1500			350	150	250	25	6.25	270	2.0	2.0
LH1540			350	120	250	25	6.25	210	2.0	2.0
LH1546			350	120		35		200	3.0	3.0
LH1550[1]			350	100	—	50	—	200	3.0	3.0
LH1535			400	120	250	25	6.25	250[10]	2.0	2.0
VO14642			60	1000	2000	0.25	0.07	—	0.8*	0.8*
LH1513	2 Form A	8	200	140	—	15	—	360	2.5*	2.5*
LH1503			350	110	—	25	—	270	2.5*	2.5*
LH1522	Dual 1 Form A	8	200	140	—	15	—	360	2.0*	2.0*
LH1544[1]			200	40	—	160	—	—	0.5	0.5
LH1505			250	120	—	20	—	200	4.0	4.0
LH1520			350	110	—	25	—	270	2.0	2.0
LH1526			400	100	—	36	—	210	1.0	1.5
LH1532[5]			350	110	—	25	—	210	2.0	2.5
LH1533			350	70	—	50	—	200	3.0	3.0
LH1556[5]			350	120	—	35	—	210	3.0	3.0
LH1511	1 Form B	6	200	200	300	15	3.75	—	3.0*	3.0*
LH1501			350	150	200	25	6.25	—	3.0	3.0
LH1521	Dual 1 Form B	8	350	110	—	25	—	—	3.0	3.0
LH1523			200	140	—	15	—	—	3.0*	3.0*
LH1502[2]	1 Form A, B/C	8	350	150	—	25	—	290	6.0*	3.0*
LH1512			200	200	—	15	—	360	3.0*	3.0*
LH1529[5,6,7]	1 Form A w/ Optocoupler	8	350	120	—	25	—	210	2.5	2.5
LH1262	MOSFET Driver	8	15	—	14 µA*	—	—	—	35 µs**	90 µs**
VO1263			15	—	23 µA*	—	—	—	26 µs**	73 µs**
VOM1271T[5]		4	7.8	—	6 µA*	—	—	—	53 µs**	24 µs**

* I_F = 10 mA
** I_F = 20 mA

1. Low capacitance SSR (3.5 pF)
2. Break-before-make operation
3. High-frequency SSR (< 50 MHz)
4. Current through both poles operating simultaneously. Load current for individual pole ratios is higher
5. Surface mount Flat-Pack available
6. Current transfer ratio min. 33 %
7. Current transfer ratio min. 100 %
8. Current transfer ratio > 300 %
9. DC current limit 720 mA
10. AC Only

Input Characteristics

	Description		LED Operating Current Min. (mA)		
Relay Type	Package	Pins	25 °C Test Specs	Recommended Current for 85 °C Operation	I/O Isolation Min. (V_{rms})
LH1546[5]	1 Form A	4	2.0	5.0	5300
VO1400AEFTR[5]			0.3	3.2	1500
LH1510[9]	1 Form A	6	2.0	5.0	5300
LH1518			2.0	5.0	5300
LH1500			2.0	5.0	5300
LH1540			2.0	5.0	5300
LH1546			2.0	5.0	5300
LH1550[1]			2.0	5.0	5300
LH1535			2.0	5.0	5300
VO14642			2.0	1.3	5300
LH1513	2 Form A	8	3.0	8.0	5300
LH1503			3.0	8.0	5300
LH1522	Dual 1 Form A	8	2.0	5.0	5300
LH1544[1]			2.0	5.0	5300
LH1505			2.0	5.0	5300
LH1520			2.0	5.0	5300
LH1526			0.5	5.0	5300
LH1532[5]			2.5	5.0	5300
LH1533			2.5	5.0	5300
LH1556[5]			2.0	5.0	5300
LH1511	1 Form B	6	2.0	5.0	3750
LH1501			2.0	5.0	3750
LH1521	Dual 1 Form B	8	2.0	5.0	3750
LH1523			2.0	5.0	3750
LH1502[2]	1 Form A, B/C	8	2.0	5.0	3750
LH1512			2.0	5.0	3750
LH1529[5,6,7]	1 Form A w/Optocoupler	8	2.0	5.0	5300
LH1262	MOSFET Driver	8	—	—	5300
VO1263			—	—	5300
VOM1271T[5]		4	—	—	4500

* I_F = 10 mA
** I_F = 20 mA

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7. Current transfer ratio min. 100 %
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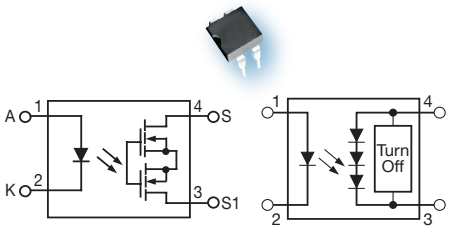
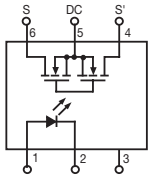
OPTOCOUPLER SOLID STATE RELAYS

DIP/ MiniFlat



1 Form A*



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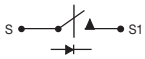

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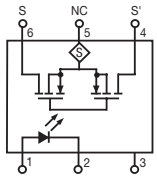
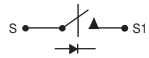
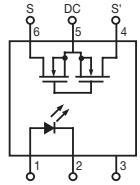


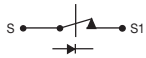
1 Form A



1 Form B*



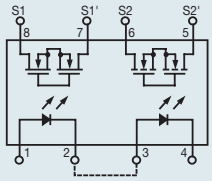
1 Form B



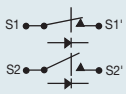
* Form A "normally open"; Form B "normally closed"

6-Pin DIP/SMD

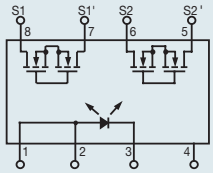
1 Form A/B, C



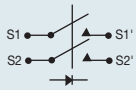
1 Form A, B, C



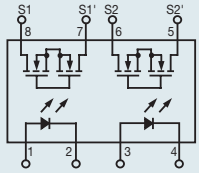
2 Form A*



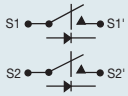
2 Form A



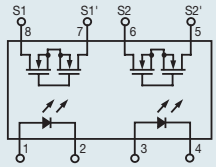
Dual 1 Form A*



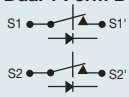
Dual 1 Form A



Dual 1 Form B*

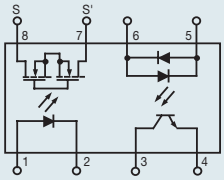


Dual 1 Form B

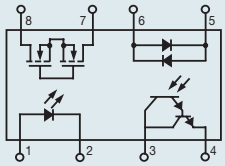


8-Pin DIP/SMD MiniFlat

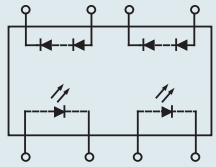
1 Form A/Optocoupler



1 Form A/Darlington

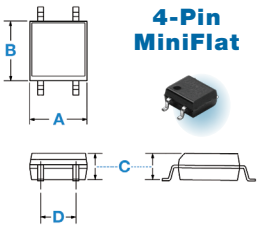


MOSFET Driver

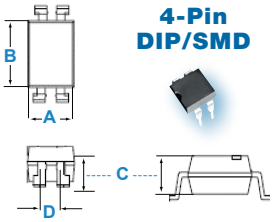


See data sheet for Pinout

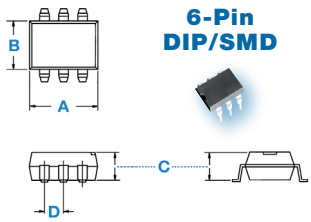
4-Pin MiniFlat



4-Pin DIP/SMD

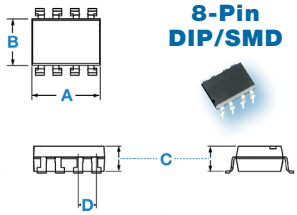


6-Pin DIP/SMD



DIP body dimensions are the same as the SMD version presented on this drawing.

8-Pin DIP/SMD



DIP body dimensions are the same as the SMD version presented on this drawing.

MiniFlat	4-Pin*	8-Pin*
A	0.174 (0.442)	0.374 (9.61)
B	0.180 (4.70)	0.180 (4.70)
C	0.080 (2.03)	0.080 (2.03)
D	0.100 (2.54)	0.100 (2.54)

Typical* dimensions = inches (mm)

SMD/DIP	4-Pin*	6-Pin*	8-Pin*
A	0.261 (6.62)	0.343 (8.60)	0.385 (9.78)
B	0.300 (7.62)	0.300 (7.62)	0.300 (7.62)
C	0.140 (3.35)	0.140 (3.30)	0.140 (3.30)
D	0.100 (2.54)	0.100 (2.54)	0.100 (2.54)

Typical* dimensions = inches (mm)

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