# SIEMENS

# LH1298

## HIGH VOLTAGE, SOLID STATE RELAY OPTOCOUPLER

### FEATURES

- **Normally Closed, Single Pole Single Throw Operation**
- **Control 350 VAC or DC Voltage**
- **Switch 100 mA Loads**
- **LED Control Current, 1.5 mA**
- **Low ON-Resistance**
- **dv/dt, >500 V/ms**
- **Isolation Test Voltage, 3750 $VAC_{RMS}$**
- **Current Limiting**
- **Underwriters Lab File # E52744**

### APPLICATIONS

- **Telephone Switch Hook**
- **High Voltage Test Equipment**
- **TRIAC Driver**
- **Motor Control**
- **Industrial Control Systems**

### DESCRIPTION

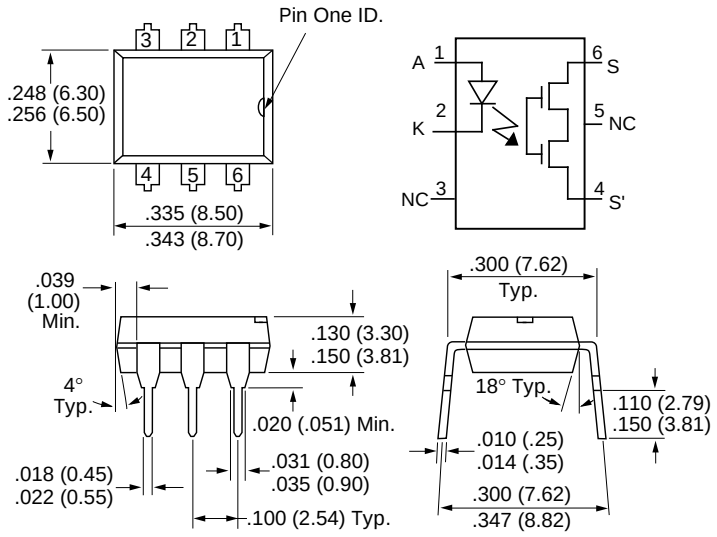
The LH1298 is a single pole single throw (SPST), normally closed (NC), solid state relay. The relay can control AC or DC loads currents up to 100 mA, with a supply voltage up to 350 V. The device is packaged in a six pin 0.3 inch dual-in line package. This package offers an insulation dielectric withstand of 3750 $VAC_{RMS}$.

The coupler consists of a AlGaAs LED that is optically coupled to a dielectrically isolated monolithic integrated circuit. The IC chip consists of a photodiode array, control circuitry and high voltage DMOS transistors. The typical ON resistance between the output terminals is 30 Ω at 0 mA LED current. The switch offers low off-state leakage current at LED current of 5 mA or greater. There is on board output current limiting circuitry.

### Maximum Ratings

Terminal Voltage ..... 350 V
Terminal Current ..... 100 mA
LED Forward Current ..... 60 mA
LED Reverse Current ..... 6 mA
Isolation Test Voltage ..... 3750 $VAC_{RMS}$
Isolation Resistance
$V_{IO}$=500 V, $T_A$=25°C ..... $\geq 10^{12}$ Ω
$V_{IO}$=500 V, $T_A$=100°C ..... $\geq 10^{11}$ W
Operating Temperature Range ..... –40 to +85°C
Storage Temperature Range ..... –40 to +150°C
Lead Soldering Temperature
at 260°C, 2 mm from case ..... 5 sec.

Package Dimensions in Inches (mm)




**Characteristics** ($T_A$=25°C)

| Emitter | Sym | Min. | Typ. | Max. | Units | Condition |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_F$ | | 1.25 | 1.5 | V | $I_F$=10 mA |
| $V_F$ Temperature Coefficient | $\Delta V_F/\Delta T_A$ | | –2.2 | | mV/°C | |
| Reverse Current | $I_R$ | | 1 | 10 | µA | $V_R$=6 V |
| Junction Capacitance | $C_J$ | | 15 | | pF | $V_R$=0 V f=1 MHz |
| Dynamic Resistance | $\Delta V_F/\Delta I_F$ | | 6 | | W | $I_F$=10 mA |
| Switching Time | $t_R$, $t_F$ | | 1 | | µs | $I_F$=10 mA |
| **Detector** | | | | | | |
| Output Breakdown Voltage | VB | 350 | | | V | $I_B$=50 µA |
| Output OFF-State Leakage Current | $I_{T(OFF)}$ | | 0.1<br>0.1 | 1<br>5 | µA<br>µA | $V_T$=100 V, $I_F$=5 mA<br>$V_T$=300 V, $I_F$=2.5 mA |
| Terminal Capacitance | $C_T$ | | 24 | | pF | $V_T$=0, f= MHz |
| Current Limit | | | 150 | | mA | |
| **Package** | | | | | | |
| LED Forward Current, Turn-Off | $I_{Fth}$ | | 1.5 | 2.5 | mA | $V_L$=±300 V, $T_A$=25°C |
| ON-resistance | $R_{ON}$ | 20 | 30 | 50 | W | $I_T$=±25 mA, $I_F$=0 mA |
| Turn-on Time | $T_{ON}$ | | | 3 | ms | $I_F$=5 mA, $V_L$=50 V, $R_L$=1 kΩ |
| Turn-off Time | $T_{OFF}$ | | | 2 | ms | |