## 1. DESCRIPTION

The XL2981 and XD2981 are 8-channel, high-voltage, high-current source driver array ideal for switching high-power loads from logic-level TTL, CMOS, or PMOS control signals.

These drivers can manage multiple loads of up to 50V and 500mA, limited only by package power dissipation.

Xinluda's XL2981/XD2981 features inputs compatible with 5V TTL and 5V to 15V CMOS or PMOS logic outputs.

The XL2981 and XD2981 are available in the 18-pin plastic DIP and 18-lead wide SOP package. Both devices operate in the industrial temperature range.

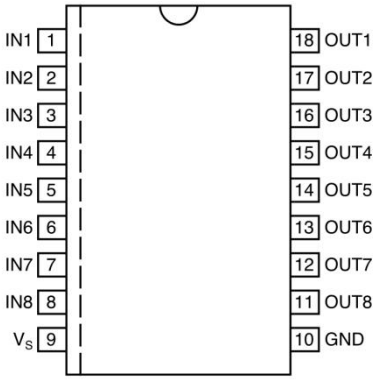
## 2. FEATURES

- Output voltage to 50V
- Output current to 500mA
- Transient-protected outputs
- Integral clamp diodes
- TTL, CMOS, or PMOS compatible inputs
- Package option: XL2981 (SOP18), XD2981 (DIP18)

## 3. TYPICAL APPLICATION

- Relay and solenoid switching
- Stepping motor
- LED and incandescent displays

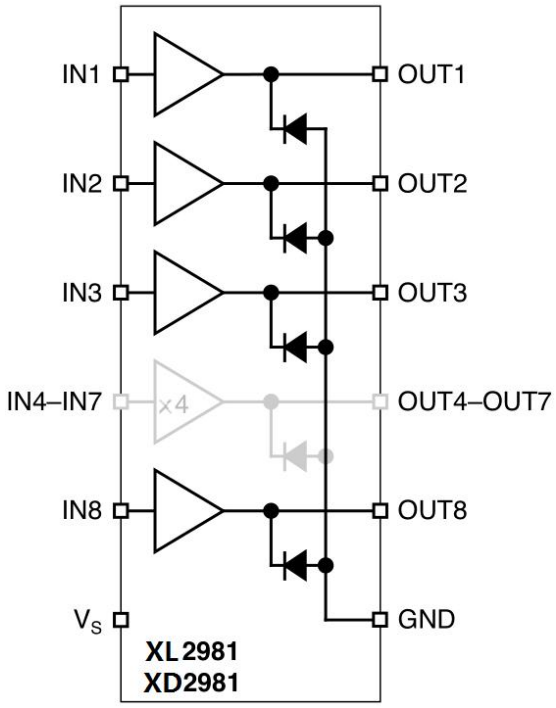
## 4. PIN CONFIGURATIONS AND FUNCTIONS

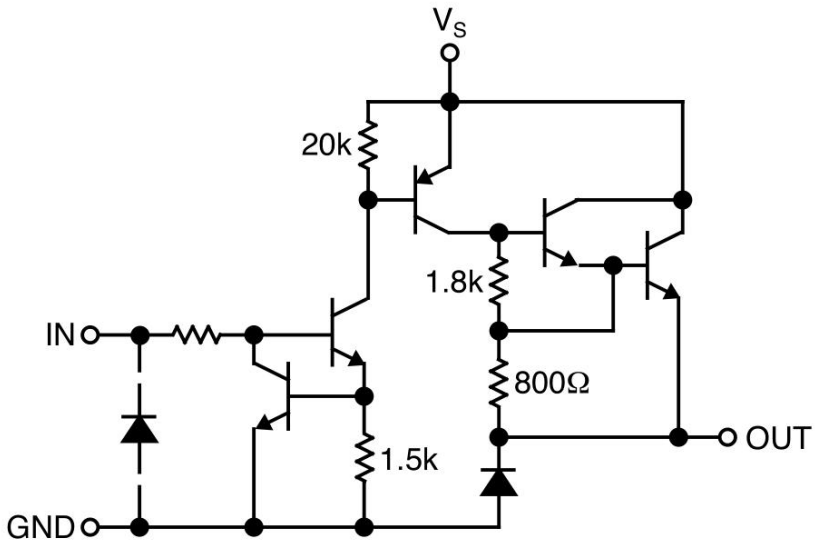



**(Top view)**

| Pin No. | Pin No. | Pin Name | Pin Function |
|---|---|---|---|
| 1–8 | IN1–IN8 | Input 1 through Input 8: Base drive to driver input transistor. | |
| 9 | $V_S$ | Supply Input | |
| 10 | GND | Ground | |
| 11–18 | OUT8–OUT1 | Output 8 through Output 1: Emitter of Darlington driver output. | |

## 5. BLOCK DIAGRAM




Typical XL/XD2891 Source Driver

## 6. ABSOLUTE MAXIMUM RATINGS

Supply Voltage ($V_S$)..... V

Output Voltage (VCE).....V
Continuous Output Current ($I_C$)..... 500mA
Input Voltage ($V_{IN}$)

XL/XD2981.....V

Ground Current (IGND)..... 3A
Storage Temperature ($T_S$).....-65°C to +150°C

## 7. OPERATING RATINGS

Supply Voltage (VS).....V to 50V
Ambient Temperature (TA)..... -40°C to +85°C
Package Thermal Resistance
PDIP $\theta_{JA}$..... 56 °C/W
SOP $\theta_{JA}$.....84°C/W

## 8. ELECTRICAL CHARACTERISTICS(Note 3)

$V_S$ = 50V, $T_A$ = +25°C, unless noted.

| Symbol | Parameter | Condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| $I_{CEX}$ | Output Leakage Current | $V_{IN}$ = 0.4V, $T_A$ = +70°C, **Note 1** | | | 200 | µA |
| $V_{CE(sus)}$ | Output Sustaining Voltage | $I_{OUT}$ = 45mA | 35 | | | V |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $V_{IN}$ = 2.4V, $I_{OUT}$ = 100mA $V_{IN}$<br>= 2.4V, $I_{OUT}$ = 225mA<br>$V_{IN}$ = 2.4V, $I_{OUT}$ = 350mA | | 1.7<br>1.8<br>1.9 | 2.0<br>2.1<br>2.2 | V<br>V<br>V |
| $I_{IN(on)}$ | Input Current | XL/XD2981 $V_{IN}$ = 2.4V<br>$V_{IN}$ = 3.85 | | 140<br>310 | 200<br>450 | µA<br>µA |
| $I_{OUT}$ | Output Source Current | $V_{IN}$ = 2.4V, $V_{CE}$ = 2.2V | 350 | | | mA |
| $I_S$ | Supply Current | $V_{IN}$ = 2.4, OUT1–8 = open, **Note 1** | | | 10 | mA |
| $t_{ON}$ | Turn-On Delay | 0.5$E_{IN}$ to 0.5$E_{OUT}$, $R_L$ = 100Ω, $V_S$ = 35V, | | 1.0 | 2.0 | µs |
| $t_{OFF}$ | Turn-Off Delay | 0.5$E_{IN}$ to 0.5$E_{OUT}$, $R_L$ = 100Ω, $V_S$ = 35V,<br>**Note 2** | | 5.0 | 10 | µs |
| $I_R$ | Clamp Diode Leakage Current | $V_R$ = 50V, $V_{IN}$ = 0.4V, **Note 1** | | | 50 | µA |
| $V_F$ | Clamp Diode Forward Voltage | $I_F$ = 350mA | | 1.5 | 2.0 | V |

**General Note:** Devices are ESD protected; however, handling precautions are recommended.

**Note 1:** Applied to all 8 inputs simultaneously.

**Note 2:** Load conditions affect turnoff delay.

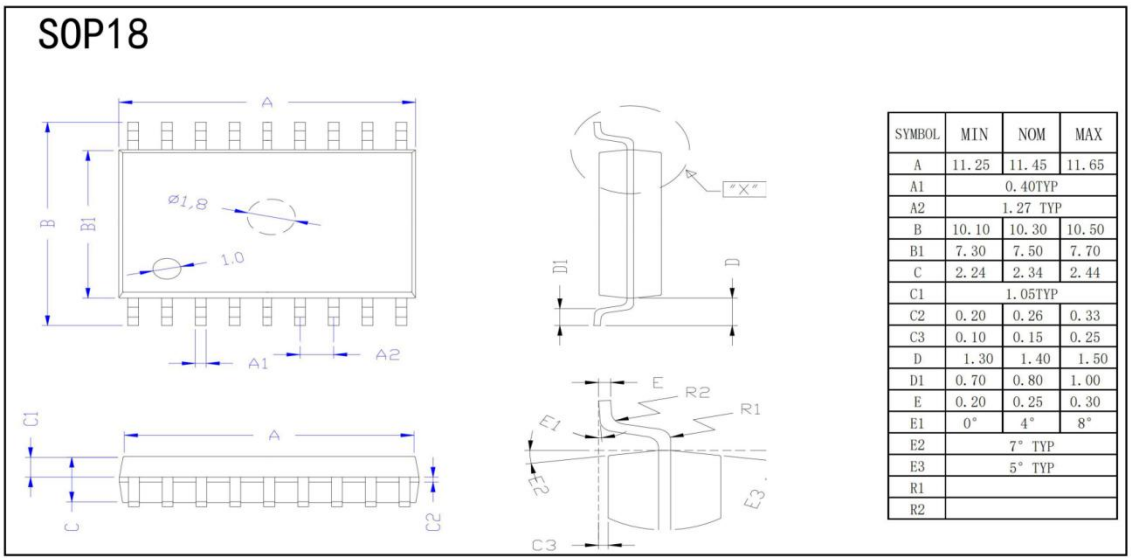
**Note 3:** Specification for packaged product only

## 9. ORDERING INFORMATION

**Ordering Information**

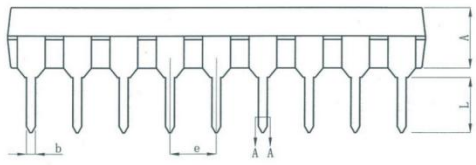
| Part Number | Device Marking | Package Type | Body size (mm) | Temperature (°C) | MSL | Transport Media | Package Quantity |
|---|---|---|---|---|---|---|---|
| XL2981 | XL2981 | SOP18 | 11.45 * 7.50 | - 40 to 85 | MSL3 | T&R | 1000 |
| XD2981 | XD2981 | DIP18 | 22.90 * 6.50 | - 40 to 85 | MSL3 | Tube 20 | 800 |

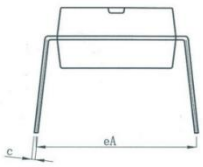
## 10. DIMENSIONAL DRAWINGS




| SYMBOL | MIN | NOM | MAX |
|---|---|---|---|
| A | 11.25 | 11.45 | 11.65 |
| A1 | | 0.40TYP | |
| A2 | | 1.27 TYP | |
| B | 10.10 | 10.30 | 10.50 |
| B1 | 7.30 | 7.50 | 7.70 |
| C | 2.24 | 2.34 | 2.44 |
| C1 | | 1.05TYP | |
| C2 | 0.20 | 0.26 | 0.33 |
| C3 | 0.10 | 0.15 | 0.25 |
| D | 1.30 | 1.40 | 1.50 |
| D1 | 0.70 | 0.80 | 1.00 |
| E | 0.20 | 0.25 | 0.30 |
| E1 | 0° | 4° | 8° |
| E2 | | 7° TYP | |
| E3 | | 5° TYP | |
| R1 | | | |
| R2 | | | |

## DIP18




| symbol | millimeter | | |
|---|---|---|---|
| | Min | Nom | Max |
| A | 3.20 | 3.30 | 3.40 |
| b | 0.44 | ---- | 0.53 |
| b1 | 0.43 | 0.46 | 0.49 |
| c | 0.25 | ---- | 0.30 |
| c1 | 0.24 | 0.25 | 0.26 |
| D | 22.80 | 22.90 | 23.00 |
| E | 6.40 | 6.50 | 6.60 |
| e | 2.54BSC | | |
| eA | 8.30 | 8.80 | 9.30 |
| L | 3.00 | ---- | ---- |