

**Features and Benefits**

- TTL, DTL, PMOS, or CMOS compatible inputs
- 500 mA output source current capability
- Transient-protected outputs
- Output breakdown voltage to 50 V
- DIP or SOIC packaging

**Description**

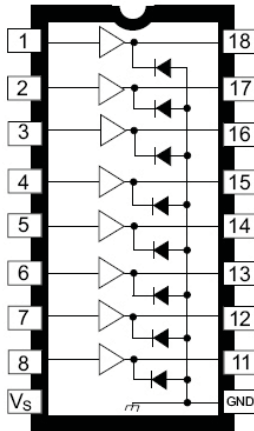
Recommended for high-side switching applications that benefit from separate logic and load grounds, these devices encompass load supply voltages to 50 V and output currents to -500 mA. These 8-channel source drivers are useful for interfacing between low-level logic and high-current loads. Typical loads include relays, solenoids, lamps, stepper and/or servo motors, print hammers, and LEDs.

All devices may be used with 5 V logic systems—TTL, Schottky TTL, DTL, and 5 V CMOS. The device packages offered are electrically interchangeable, and will withstand a maximum output off voltage of 50 V, and operate to a minimum of 5 V. All devices in this series integrate input current limiting resistors and output transient suppression diodes, and are activated by an active high input.

The suffix “A” indicates an 18-lead plastic dual in-line package with copper lead frame for optimum power dissipation. Under normal operating conditions, these devices will sustain 120 mA continuously for each of the eight outputs at an ambient temperature of +50°C and a supply of 15 V.

**Simplified Block Diagrams**

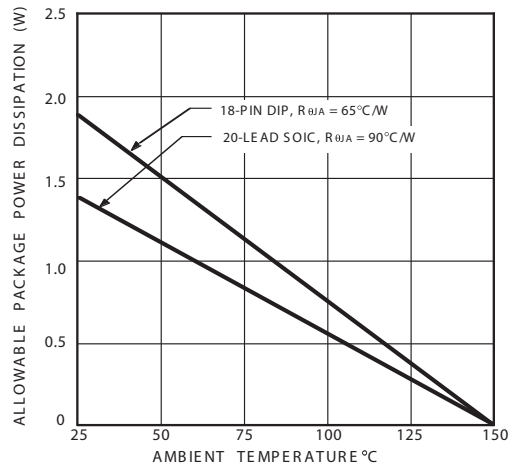
DIP18 and SOP18



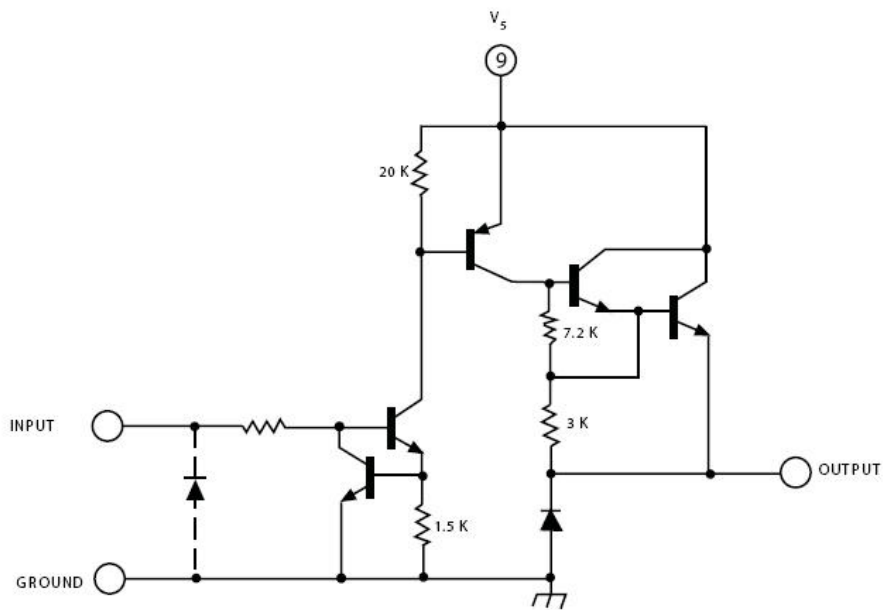
**Absolute Maximum Ratings**

Characteristic	Symbol	Notes	Rating	Units
Output Voltage Range	$V_{CE}$		5 to 50	V
Input Voltage	$V_{IN}$	2981	20	V
		XL2982SL,2981	20	V
Output Current	$I_{OUT}$		-500	mA
Package Power Dissipation	$P_D$	See graph	-	-
Operating Ambient Temperature	$T_A$	Range E	-40 to 85	°C
		Range S	-20 to 85	°C
Maximum Junction Temperature	$T_{J(max)}$		150	°C
Storage Temperature	$T_{stg}$		-55 to 150	°C

# XD2981 DIP18 / XL2981 SOP18



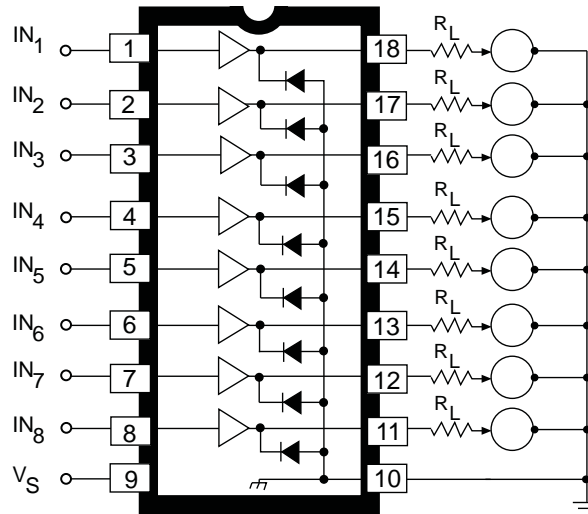
## One of Eight Drivers



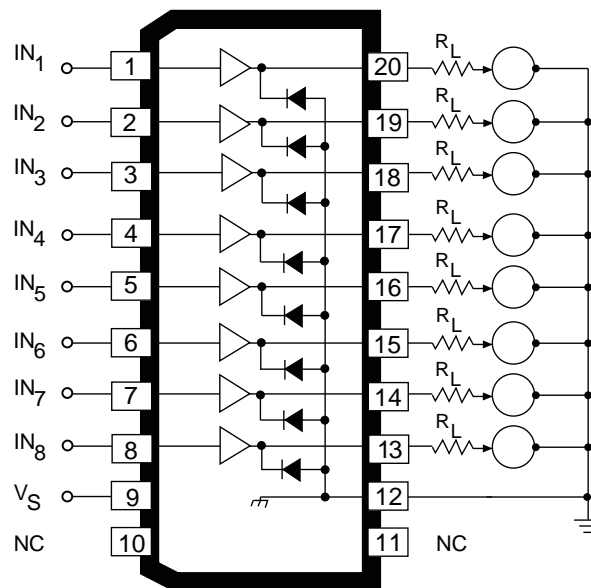
Typical electroresponsive printer application

# XD2981 DIP18 / XL2981 SOP18

2981 DIP18/SOP18



2982 SOP20 (LW Package)



Pins 10 and 11 can float; other pins  
 match discontinued 18-pin SOIC: 1 to 9  
 same, pins 12 to 20 match pins 10 to 18

# XD2981 DIP18 / XL2981 SOP18

## ELECTRICAL CHARACTERISTICS<sup>1,2</sup> at $T_A = +25^\circ\text{C}$ (unless otherwise specified).

Characteristic	Symbol	Variant	Test Conditions	Test Fig.	Min.	Typ.	Max.	Units
Output Leakage Current <sup>3</sup>	$I_{CEX}$	All	$V_{IN} = 0.4\text{ V}, V_S = 50\text{ V}$	1	—	—	20	$\mu\text{A}$
Output Sustaining Voltage	$V_{CE(SUS)}$	All	$I_{OUT} = -45\text{ mA}$	—	35	—	—	V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	All	$V_{IN} = 2.4\text{ V}, I_{OUT} = -100\text{ mA}$	2	—	1.6	1.8	V
			$V_{IN} = 2.4\text{ V}, I_{OUT} = -225\text{ mA}$	2	—	1.7	1.9	V
			$V_{IN} = 2.4\text{ V}, I_{OUT} = -350\text{ mA}$	2	—	1.8	2.0	V
Input Current	$I_{IN(ON)}$	2981	$V_{IN} = 2.4\text{ V}$	3	—	140	200	$\mu\text{A}$
			$V_{IN} = 3.85\text{ V}$	3	—	310	450	$\mu\text{A}$
		2982	$V_{IN} = 2.4\text{ V}$	3	—	140	200	$\mu\text{A}$
			$V_{IN} = 12\text{ V}$	3	—	1.25	1.93	mA
Output Source Current (Outputs Open)	$I_{OUT}$	2981	$V_{IN} = 2.4\text{ V}, V_{CE} = 2.0\text{ V}$	2	-350	—	—	mA
		2982	$V_{IN} = 2.4\text{ V}, V_{CE} = 2.0\text{ V}$	2	-350	—	—	mA
Supply Current Leakage Current	$I_S$	All	$V_{IN} = 2.4\text{ V}^*, V_S = 50\text{ V}$	4	—	—	10	mA
Clamp Diode Current	$I_R$	All	$V_R = 50\text{ V}, V_{IN} = 0.4\text{ V}^*$	5	—	—	50	$\mu\text{A}$
Clamp Diode Forward Voltage	$V_F$	All	$I_F = 350\text{ mA}$	6	—	1.5	2.0	V
Turn-On Delay	$t_{ON}$	All	$0.5 E_{IN}$ to $0.5 E_{OUT}, R_L = 100\Omega, V_S = 35\text{ V}$	—	—	0.3	2.0	$\mu\text{s}$
Turn-Off Delay <sup>4</sup>	$t_{OFF}$	All	$0.5 E_{IN}$ to $0.5 E_{OUT}, R_L = 100\Omega, V_S = 35\text{ V}$ , See Note	—	—	2.0	10	$\mu\text{s}$

<sup>1</sup>Negative current is defined as coming out of (sourcing) the specified device terminal.

<sup>2</sup>All unused inputs must be connected to ground. Pull-down resistors (approximately 10 k $\Omega$ ) are recommended for inputs that are allowed to float while power is being applied to  $V_S$ .

<sup>3</sup>All inputs simultaneously.

<sup>4</sup>Turn-off delay is influenced by load conditions. Systems applications well below the specified output loading may require timing considerations for some designs, i.e., multiplexed displays or when used in combination with sink drivers in a totem pole configuration.

# XD2981 DIP18 / XL2981 SOP18

## TEST FIGURES

Figure 1

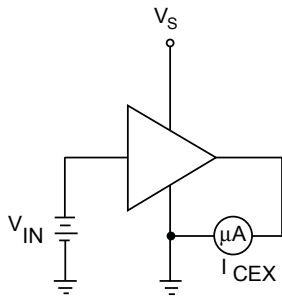


Figure 2

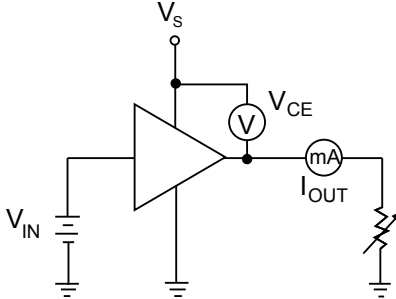


Figure 3

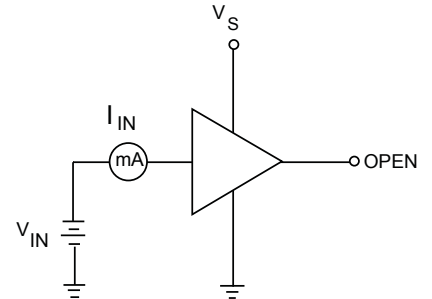


Figure 4

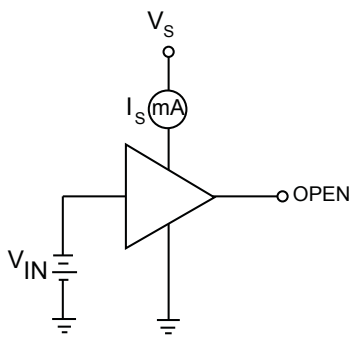


Figure 5

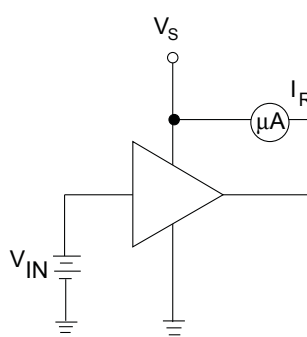
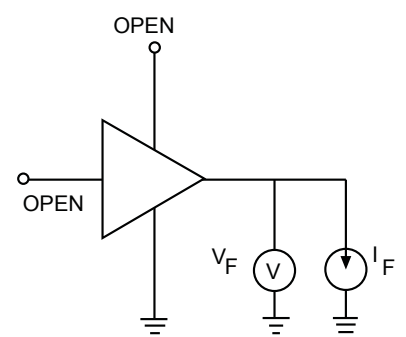


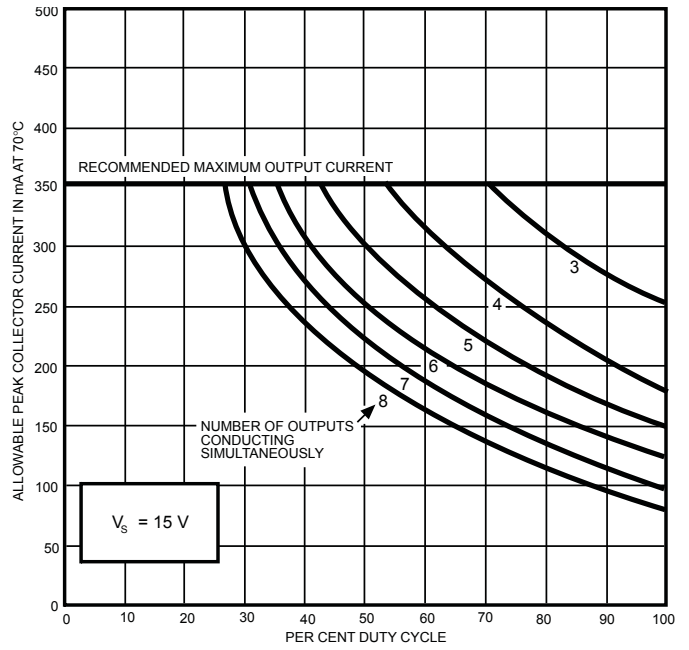
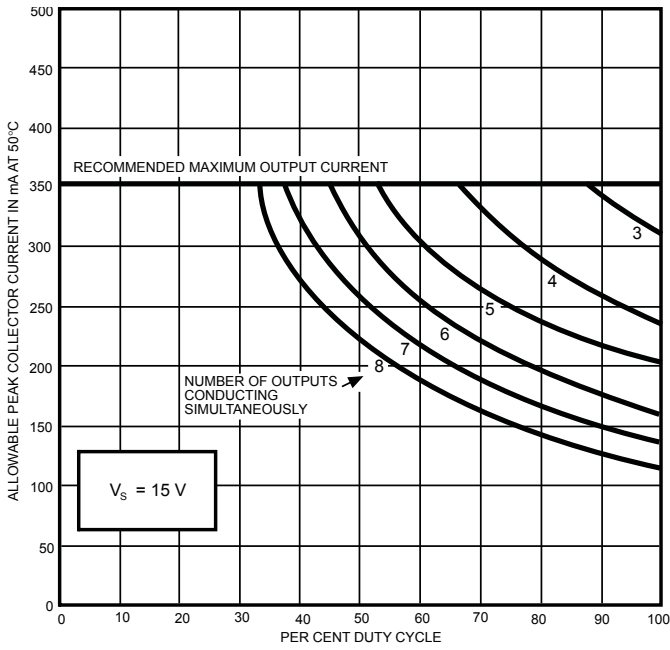
Figure 6



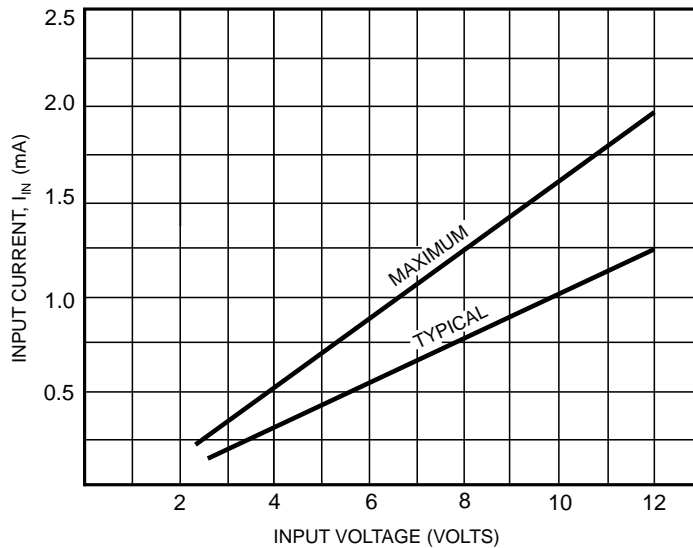
# XD2981 DIP18 / XL2981 SOP18

## Allowable peak collector current as a function of duty cycle

XDXL/2981 and XL2982SL



## Input current as a function of input voltage



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