

# SP1404BW

## HIGH VOLTAGE INTERFACE CIRCUIT

The SP1404 is a bipolar integrated circuit comprising five individual digital current amplifier circuits. Each circuit accepts a logic input from TTL, CMOS or a similar source and drives a high-current load at the output. The outputs are capable of withstanding high negative voltages in the 'off' state, making the SP1404 particularly suited to telecommunications applications.

### CIRCUIT DESCRIPTION (Fig.2)

The SP1404 operates as a power amplifier interfacing from a voltage-level sensitive input to a high-current output switch. The input threshold is TTL-compatible, with a low input current requirement enabling one standard TTL output to drive many interfaces. The low input current requirement also makes it possible to use series current-limiting resistors to protect the SP1404 inputs.

Each element of the device performs as an inverting function, i.e. a low voltage level on the input causes a high current in the output. If the input is left open-circuit, the output will be off and the output current will be zero.

The isolation of the integrated circuit is biased to the more negative of the two earth points by diodes D1 and D2 so that differences of up to  $(V_{CC} - 1)$  volts can be tolerated between the 'noisy' exchange earth and the 'quiet' electronic earth.

### ABSOLUTE MAXIMUM RATINGS

Storage temperature	-55°C to +175°C
Chip operating temperature	+150°C
Ambient temperature ( $I_{OUT} = 50\text{mA}$ )	+85 °C
Load current	80mA
Voltage between output and 'noisy earth'	-65V
$V_{CC}$ to output voltage	75V
$V_{CC}$ to electronic earth	7V
Input voltage	$V_{CC} + 1\text{V}$

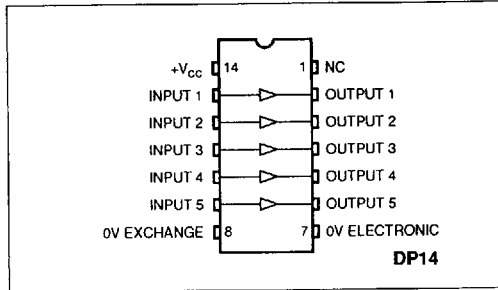


Figure 1: Pin connections (viewed from underside)

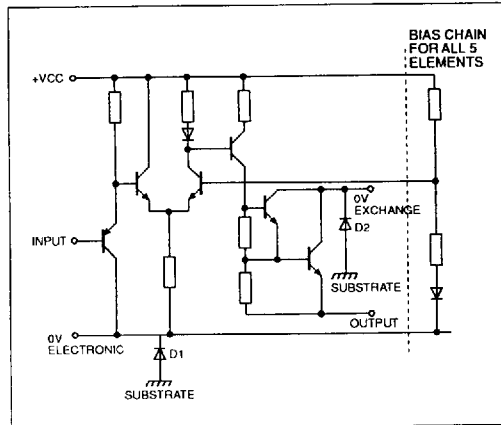


Figure 2: Circuit diagram of one element

### ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):

Temperature range = 0°C to +70°C,  $V_{CC} = +5\text{V} \pm 0.5\text{V}$

Characteristic	Value			Units	Conditions
	Min.	Typ.	Max.		
Input current		-20		$\mu\text{A}$	$V_{IN} = 0\text{V}$
Output voltage			1.5	$\mu\text{A}$	$V_{IN} = V_{CC}$
Output current (Off state)			100	V	$V_{IN} = 0.8\text{V}, I_{OUT} = 50\text{mA}$
Output current (On state)	50	80		$\mu\text{A}$	$V_{IN} = 2\text{V}, V_{OUT} = -60\text{V}$
$V_{CC}$ supply current		30		mA	$V_{IN} = 0.8\text{V}$
Total power dissipation		450		mA	$V_{CC} = 5\text{V}$ , all inputs low
				mW	$V_{CC} = 5\text{V}$ , all inputs low
					all outputs $I_{OUT} = 50\text{mA}$