

ULN 2001/2/3/4 High Voltage/ Current Darlington Transistor Arrays

GENERAL DESCRIPTION

These high-voltage, high-current Darlington transistor arrays are comprised of seven silicon NPN Darlington pairs on a common monolithic substrate. All units feature open collector outputs and integral suppression diodes for inductive loads. Peak inrush currents to 600mA are allowable, making them ideal for driving tungsten filament lamps also.

The Type ULN-2001 is a general-purpose array which may be used with DTL, TTL, PMOS, CMOS, etc. It is pinned with inputs opposite outputs to facilitate ease of circuit board layout and is priced to compete directly with discrete transistor alternatives.

The Type ULN-2002 was specifically designed for use with 14 to 25V PMOS devices. Each input has a Zener diode and resistor in series in order to limit the input current to a safe value.

The Type ULN-2003 has a series base resistor to each Darlington pair, and thus allows operation directly with TTL or CMOS operating at a supply voltage of 5V.

The Type ULN-2004 has an appropriate series input resistor to allow its operation directly from CMOS or PMOS outputs utilizing supply voltages of 6 to 15V. The required input current is below that of the Type ULN-2003 while the required input voltage is less than that required by the Type ULN-2002.

In all cases, the individual Darlington pair collector current rating is 500mA. However, outputs may be paralleled for higher load current capability.

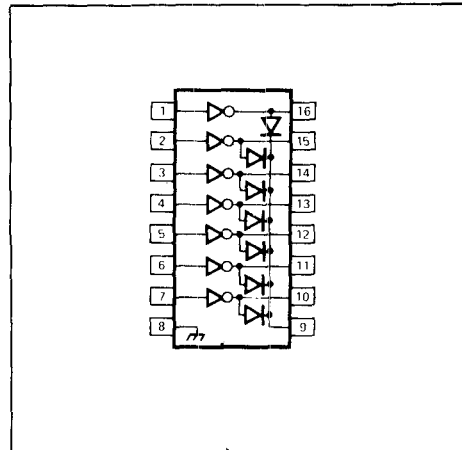
FEATURES

- Peak inrush current 600mA
- Protected internally against inductive loads
- Open collector topology
- Compatible with most logic technologies

REFERENCE TABLE

TYPE NO.	STOCK NO.	OUTLINE DRWG. NO.
ULN 2001N	55814C	2
ULN 2002N	55815A	2
ULN 2003N	55816X	2
ULN 2004N	55817H	2

CONNECTION DIAGRAM



MAXIMUM RATINGS at 25°C Free-Air temperature for
any one Darlington pair unless
otherwise specified.

PARAMETER	RATING	UNIT
V _{CE} Output voltage	50	V
V _{IN} Input voltage	30	V
V _{EBO} Emitter base voltage	6	V
I _C Continuous collector current	500	mA
I _B Continuous base current	25	mA
P _D Power dissipation	1.3	W
	Derating factor above 25°C	95 °C/W
T _A Ambient temperature range (operating)	0 to + 85	°C
T _S Storage temperature range	-65 to +150	°C

*NOTE

Under normal operating conditions, these units will sustain 350mA per output with V_{CE}(SAT) = 1.6V at 70°C with a pulse width of 20 ms and a duty cycle of 30%.

PLEASE QUOTE STOCK NO.
AND MANUFACTURERS PART NO. WHEN ORDERING

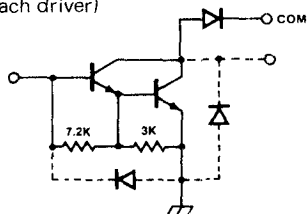
ULN GEMINI

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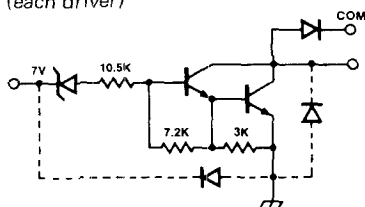
Interface — Transistor Arrays

EQUIVALENT CIRCUITS

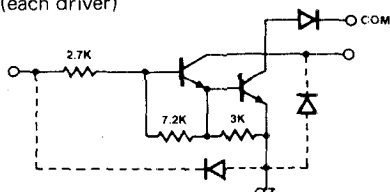
TYPE ULN2001
(each driver)



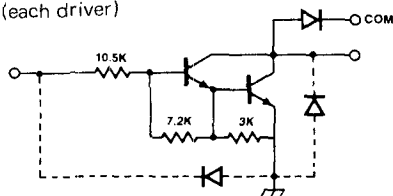
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TYPE ULN2003
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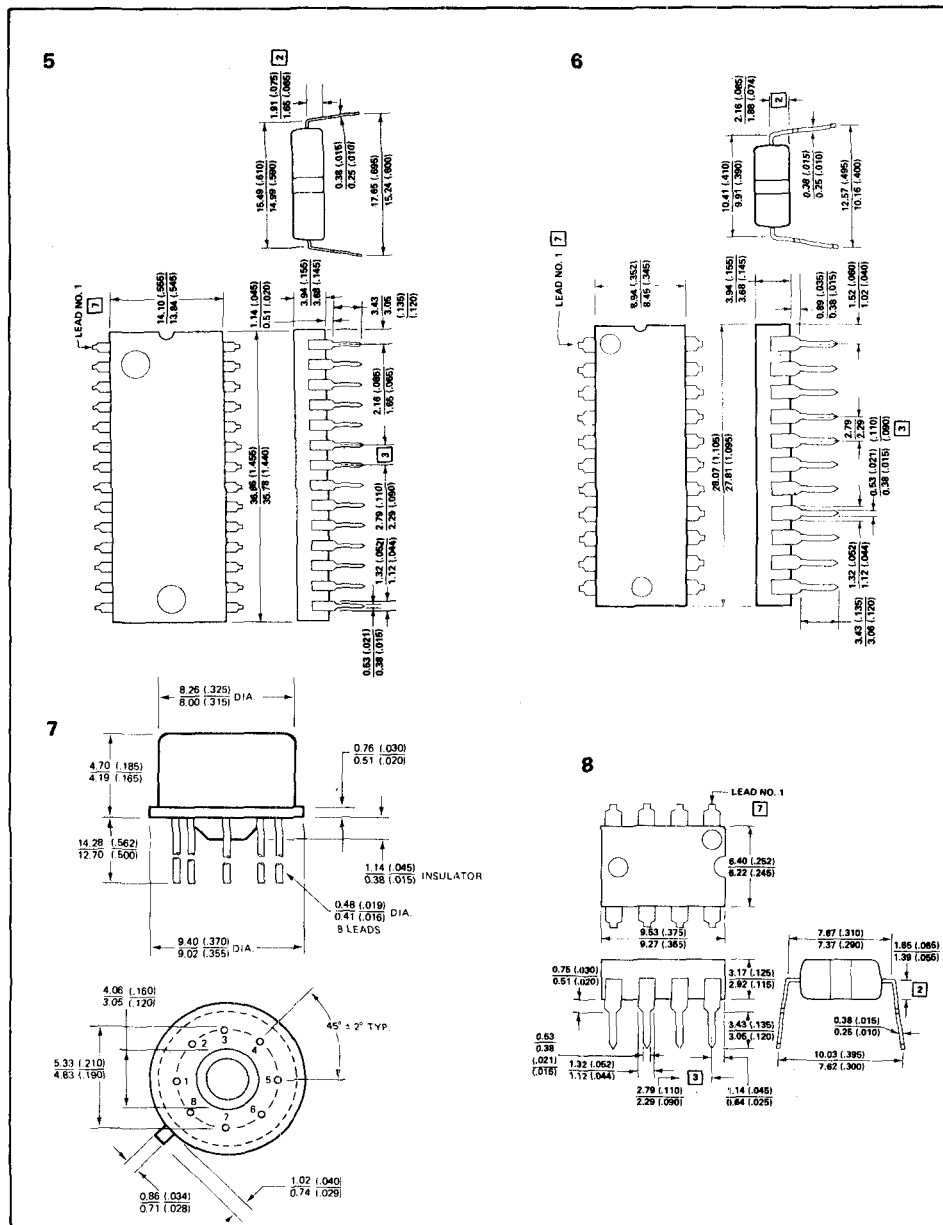


TYPE ULN2004
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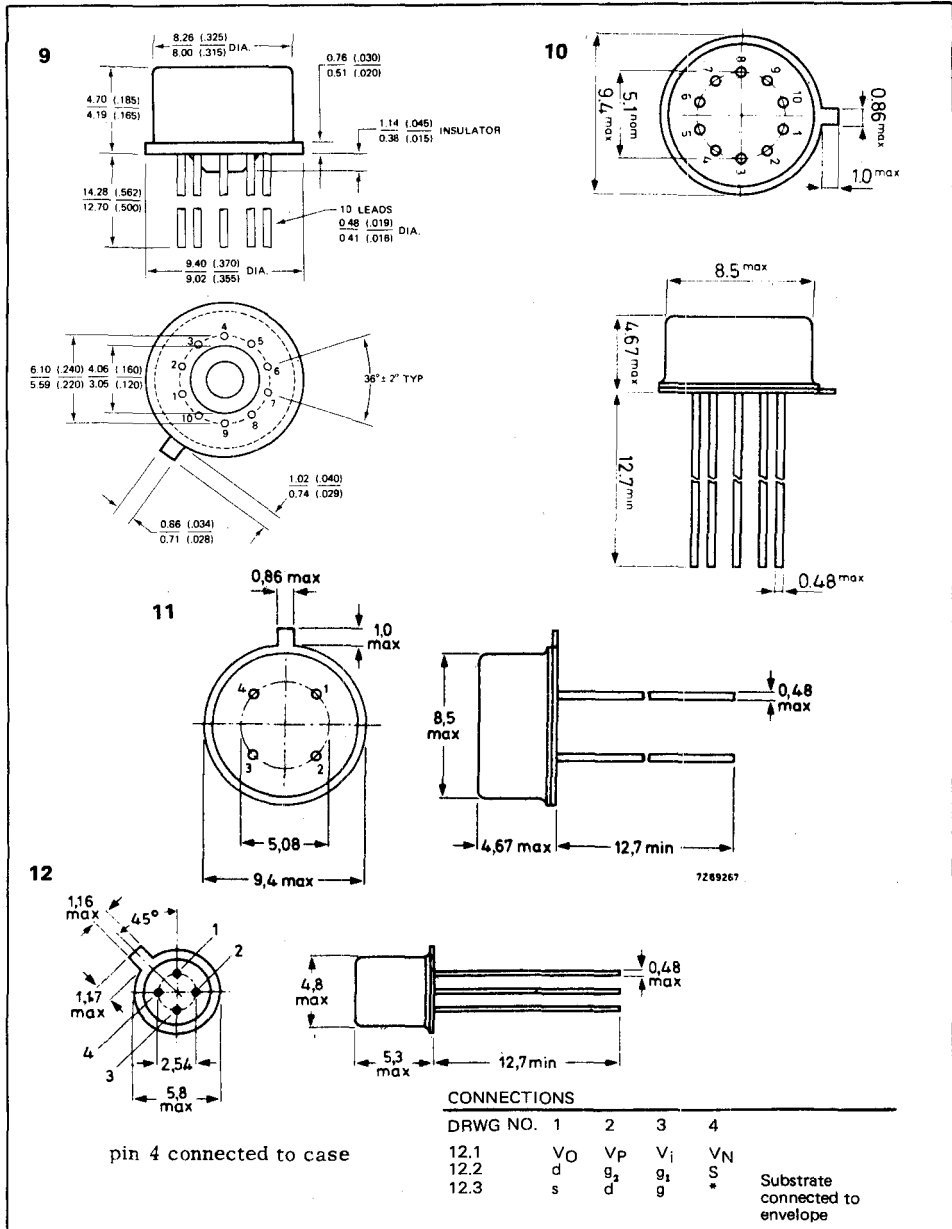
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Outline Drawings



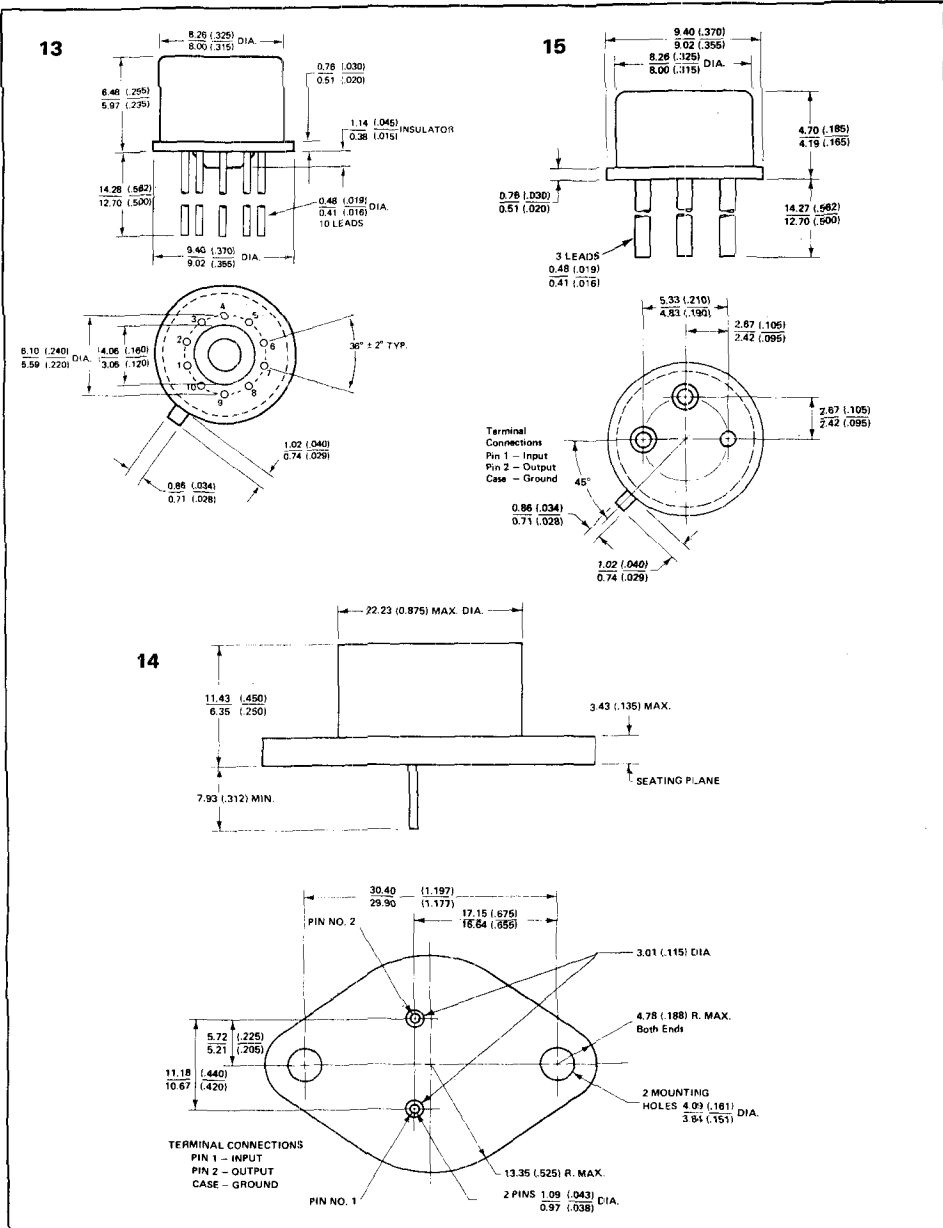
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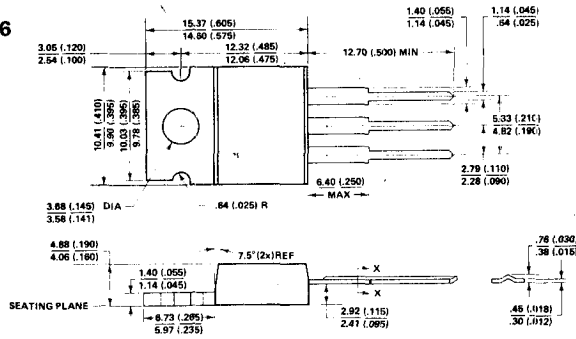


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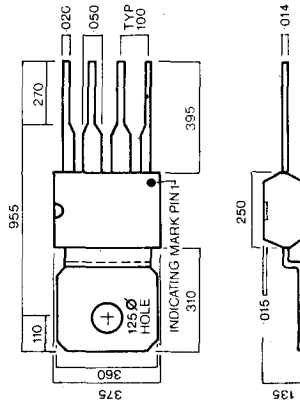
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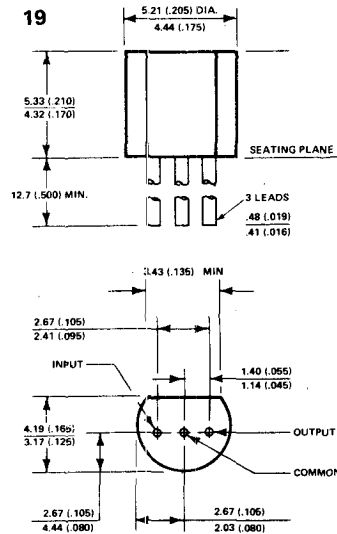
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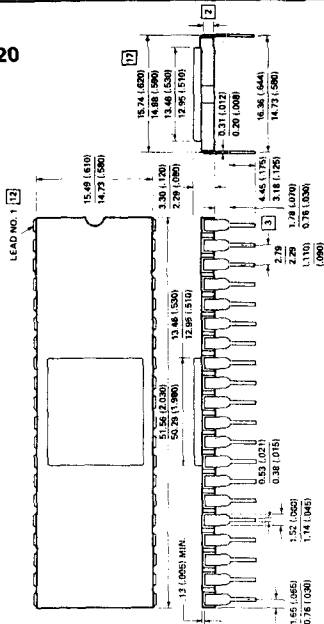
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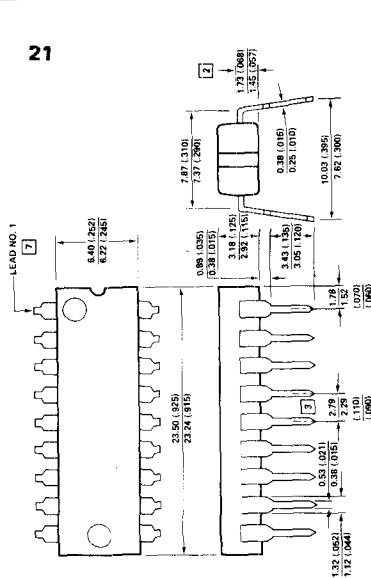
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TTT GEMINI

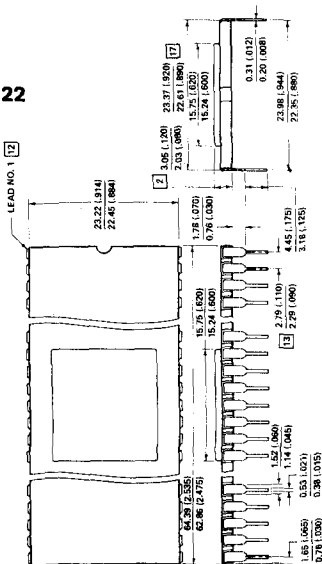
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