

Signetics

Integrated Circuits – D/A – A/D Converters

NE5009 – 8 Bit High Speed Multiplying D/A Converter

GENERAL DESCRIPTION

The 5009 monolithic 8-bit digital-to-analog converter is an electrical selection of the 5007/8 series of 8-bit D/A converters. Relative accuracy is specified to $\pm 1/4$ LSB maximum over the operating temperature range. Differential nonlinearity and settling times are also specified to maximum limits.

The device is specifically designed for precision applications in process control and military systems. The SE5009 is specified as equal or superior to the PMI DAC-08A in all respects. Additional relevant testing and application material is shown in the data sheet and application notes for the NE5007/8.

FEATURES

- Fast settling output current—60ns typical, 135ns maximum
- Relative accuracy— $\pm 0.1\%$ maximum
- Differential nonlinearity— $\pm 0.19\%$ maximum
- Low full-scale current drift, ± 10 ppm/ $^{\circ}$ C typical
- SE5009 military qualifications pending

APPLICATIONS

- Fast 8-bit A/D converter
- Variable gain amplifiers
- Waveform generators
- 3 digit BCD D/A converter (0.1%)
- Programmable power supplies

DEFINITION OF TERMS

Relative Accuracy—The maximum deviation of the DAC output relative to an ideal straight line drawn from zero to full scale; 1 LSB for any bit combination.

Differential Nonlinearity—The incremental error from an ideal 1 LSB analog output change when the digital input is changed 1 LSB; guaranteed monotonicity requires the differential linearity error be less than 1 LSB and with a tempo of essentially zero.

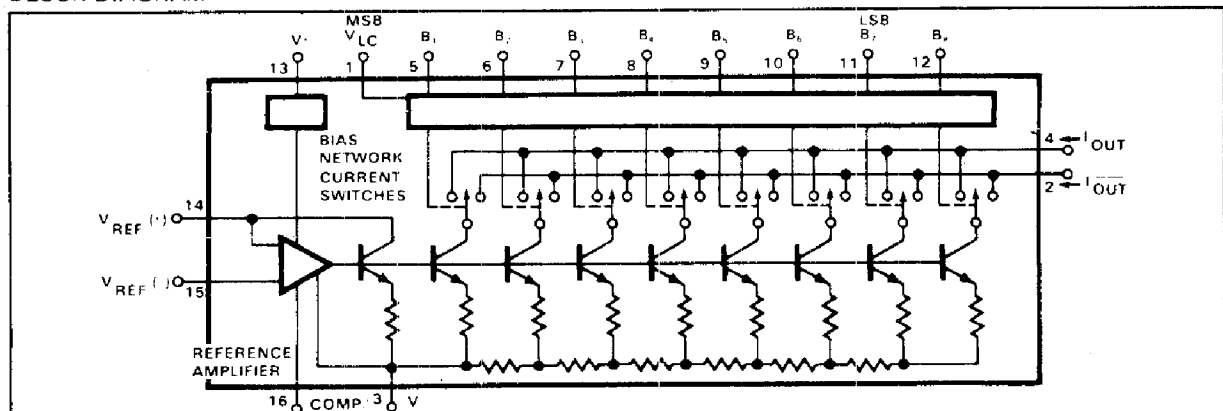
Full Scale Tempco—The change in DAC full scale current with change in temperature expressed in ppm/ $^{\circ}$ C.

Monotonicity—For a 1 LSB increase of input code, the output either increases or remains the same.

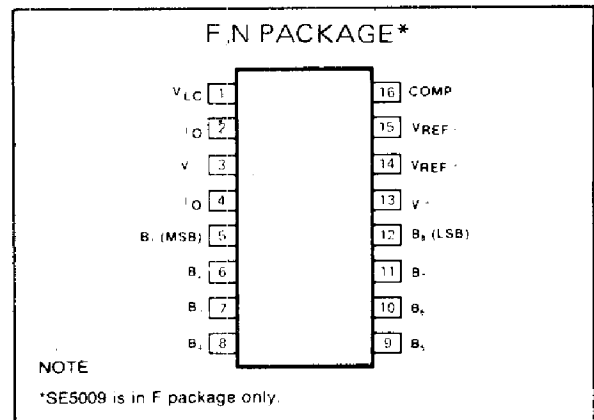
Output Voltage Compliance—The range of allowable voltage levels the output pins can assume without a major effect on circuit performance.

Power Supply Sensitivity—The change in DAC output current with changes in power supply voltage.

BLOCK DIAGRAM



CONNECTION DIAGRAM



REFERENCE TABLE

TYPE NO	STOCK NO.	OUTLINE DRWG. NO.
NE5009F	56088D	2

MAXIMUM RATINGS (TA = 25 $^{\circ}$ C unless otherwise specified)

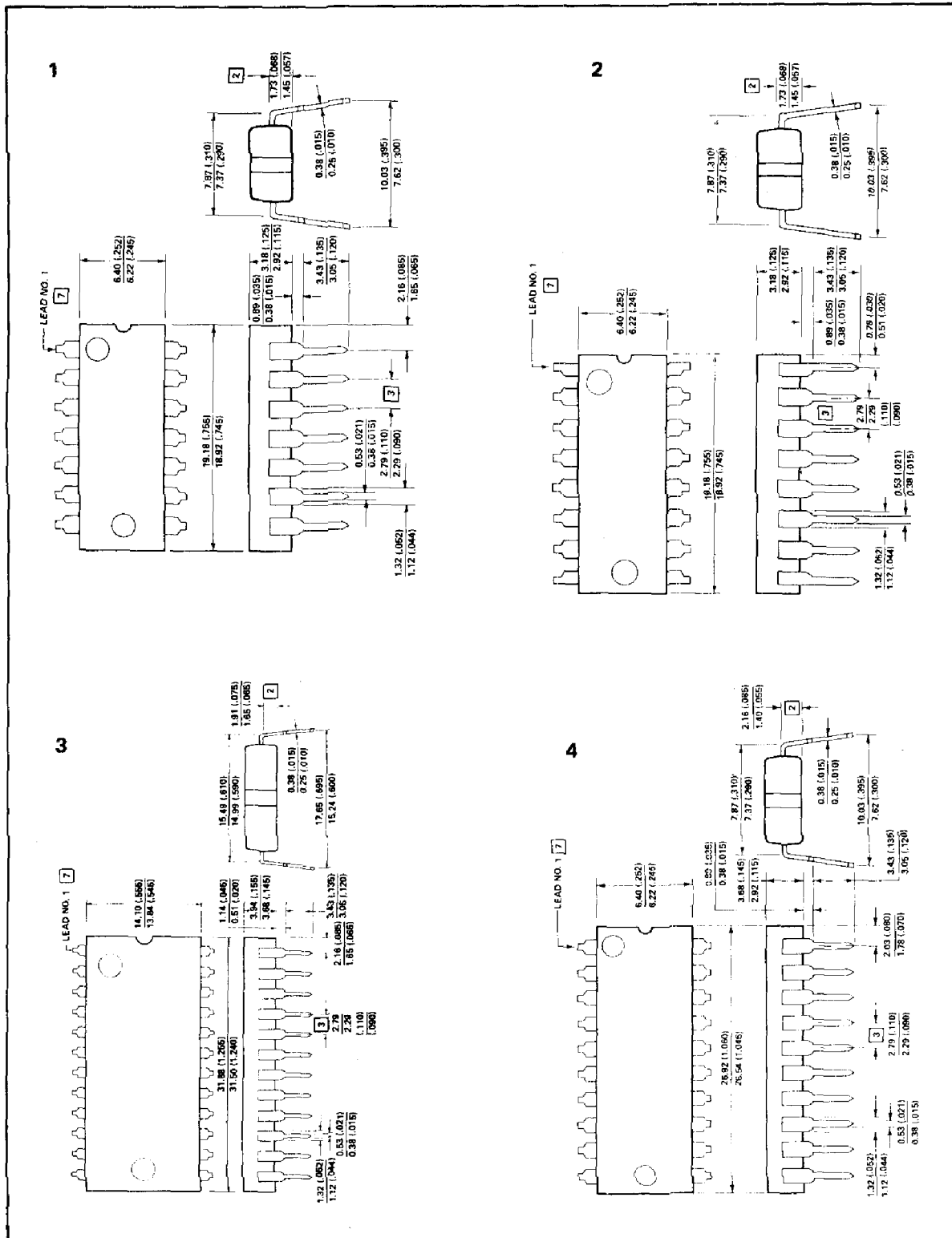
PARAMETER	RATING	UNIT
Total supply voltage (V+ – V-)	36	V
Logic input voltage	V- + 36	V
VLC Voltage at pin 1	V- to V+	V
Reference input voltage	V- to V+	V
Reference input differential voltage	± 18	V
Reference input current	5.0	mA
Operating temperature range		
SE5009	-55 to +125	$^{\circ}$ C
NE5009	0 to +70	$^{\circ}$ C
Storage temperature range	-65 to +150	$^{\circ}$ C
Lead soldering temperature (10sec)	300	$^{\circ}$ C
Power dissipation *	500	mW

NOTE

*Derate F package at 10mW/ $^{\circ}$ C above 100 $^{\circ}$ C



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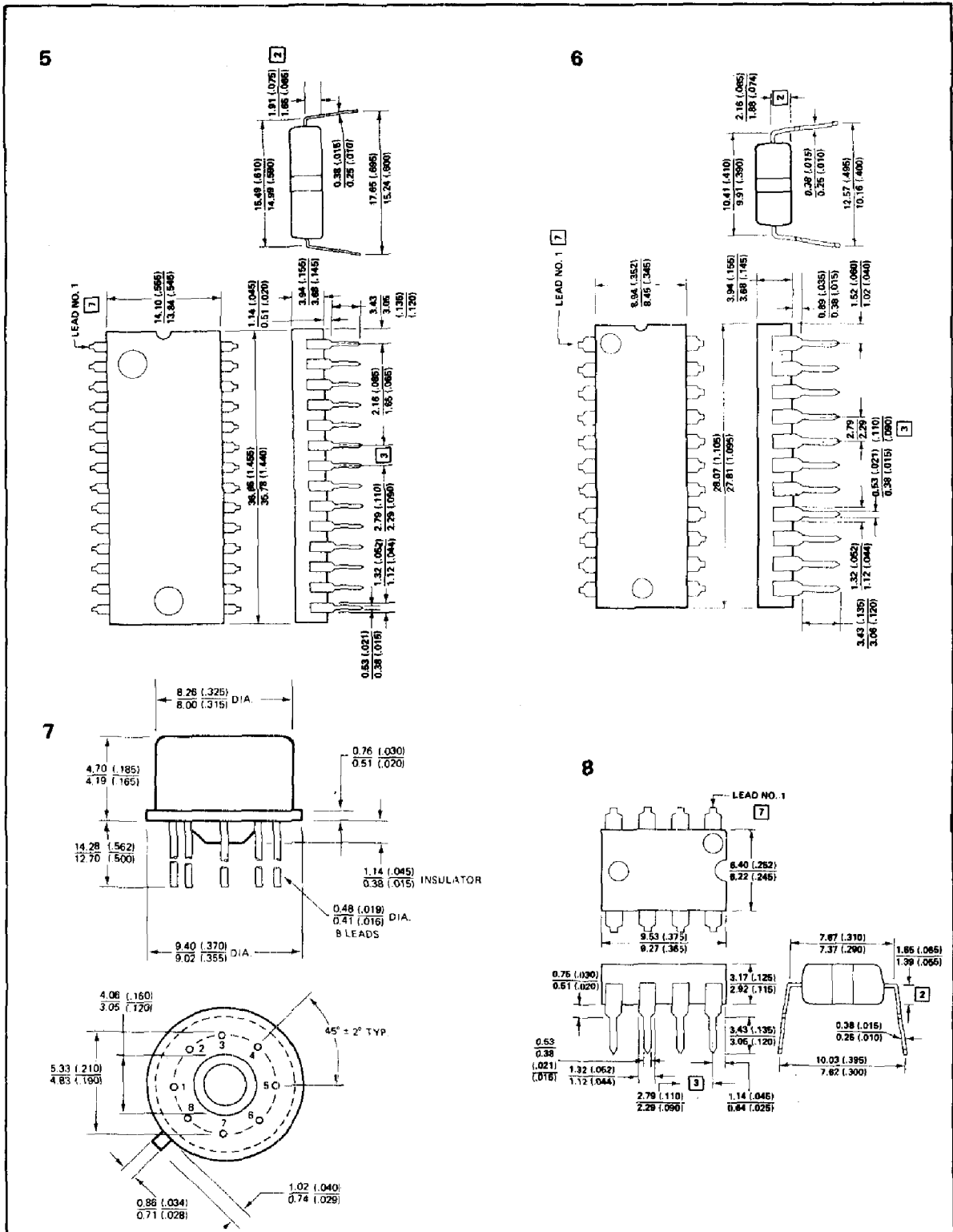


PLEASE QUOTE STOCK NO.
AND MANUFACTURERS PART NO. WHEN ORDERING



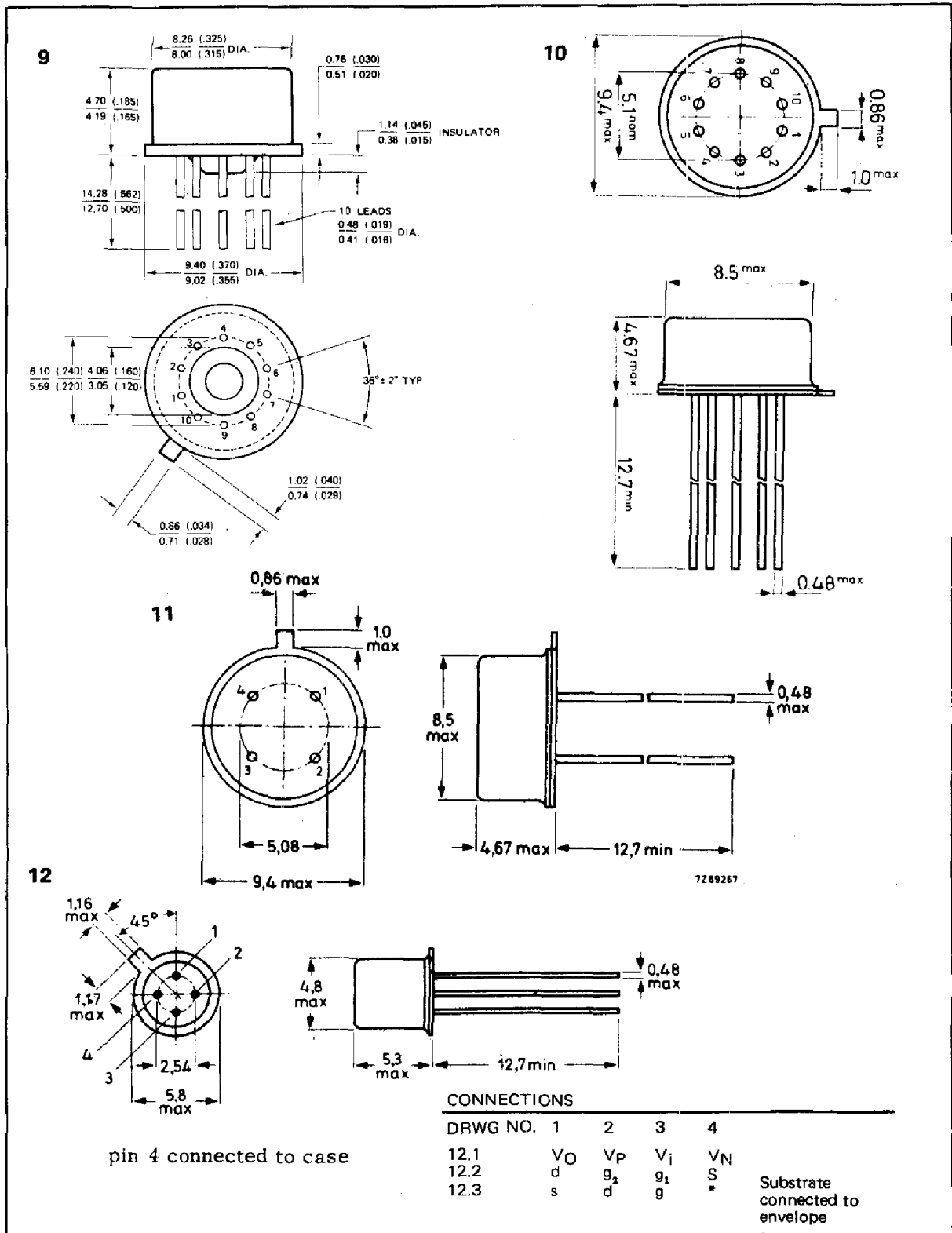
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Outline Drawings



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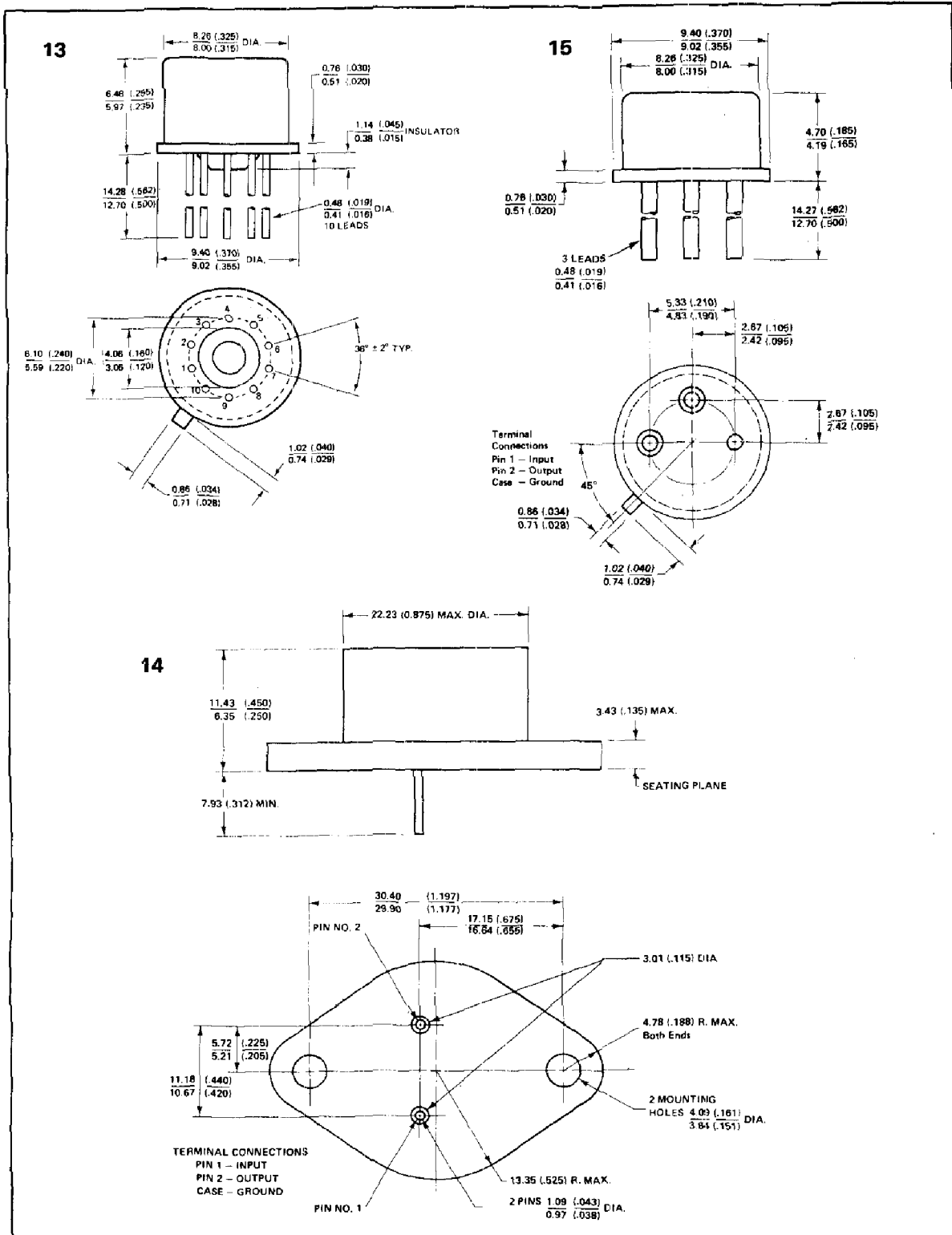


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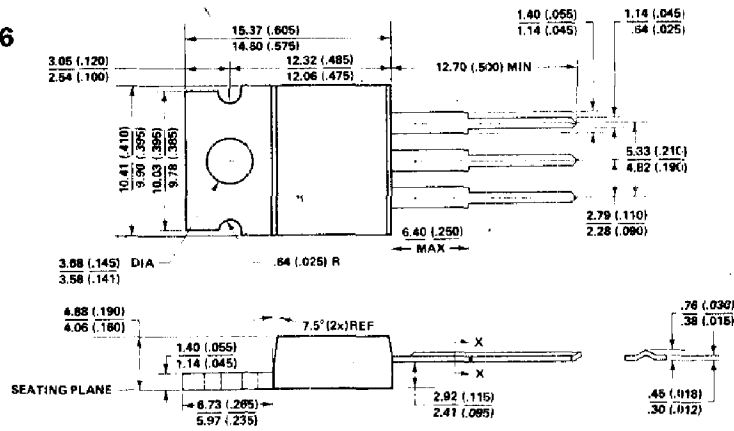
Outline Drawings



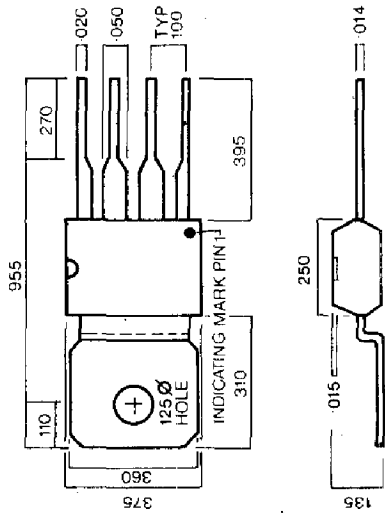
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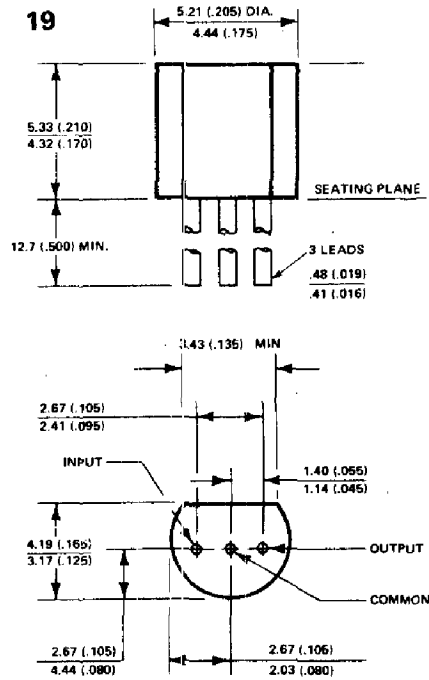
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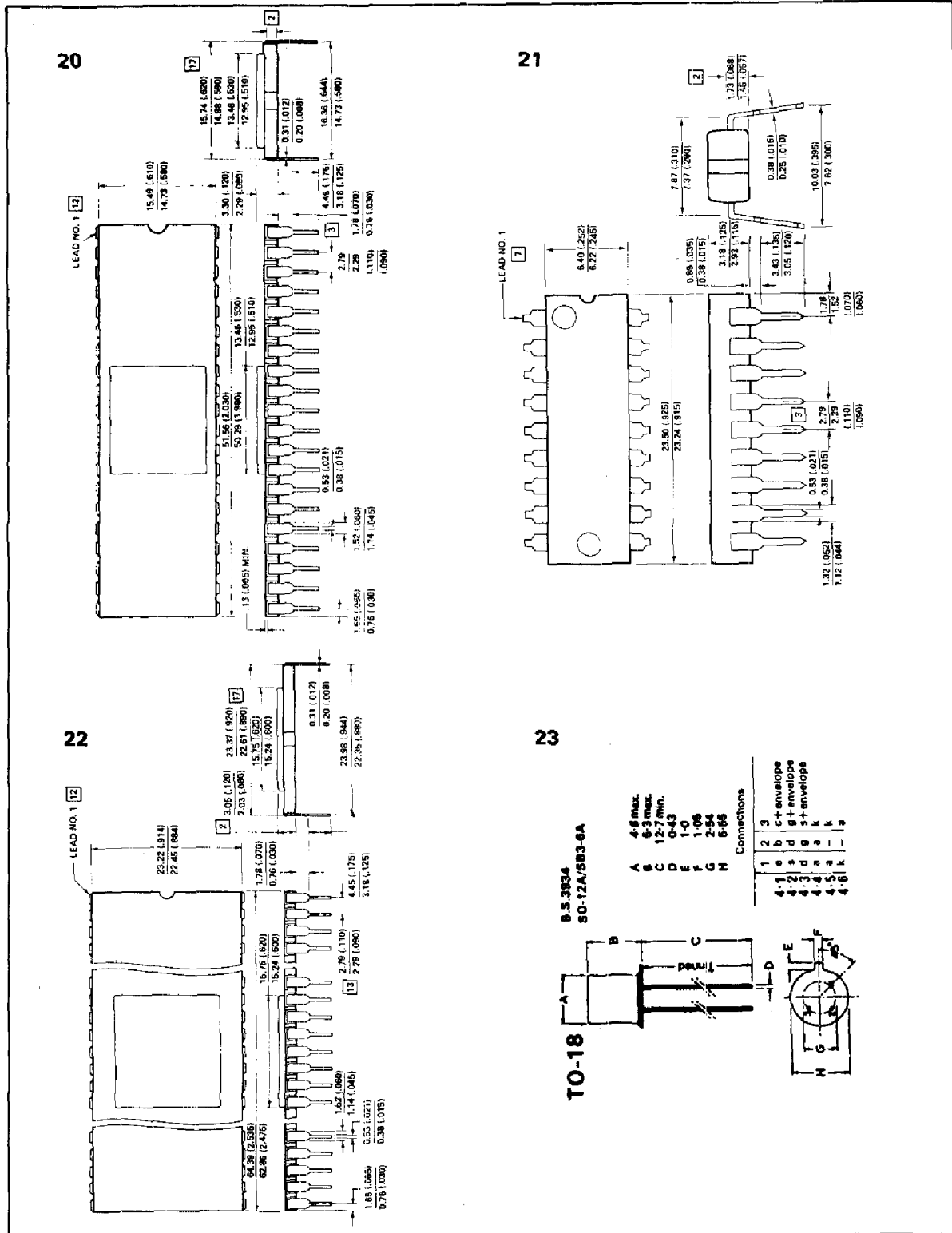


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