n-channel transducer/microphone preamplifiers *designed for . . .*

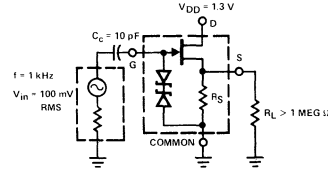
- **Hearing Aid Input Stages**
- **High Impedance Transducer Buffer Amplifiers**
  - **Electret-Condenser**
  - **Ceramic**
  - **Piezo-Electric**
  - **Capacitive**
  - **Air Condenser**
- **Self-Biased General Purpose High Impedance Source Followers**

Performance Curves NYFA NYFC See Section 4

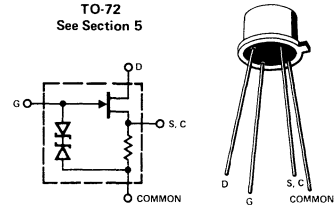
BENEFITS

- Complete Preamplifier, Requires No External Components
- Compact for Placement at Transducer
- Operates on Single Battery
- Ultra-High Input Impedance $5 \times 10^9\ \Omega$ Typical
- Available in Chip Form for Hybrid Systems

TEST CONFIGURATION



TO-72
See Section 5



ABSOLUTE MAXIMUM RATINGS (25°C)

Drain-Source and Drain-Gate Voltage	30 V
Gate Voltage (With Respect to Common)	±2.0 V
Forward Gate Current	1 mA
Total Device Dissipation (25°C Free-Air)	180 mW
Linear Derating Factor (to 85°C)	3.0 mW/°C
Storage Temperature Range	−55 to +150°C
Operating Temperature Range	−25 to +85°C
Lead Temperature (1/16" from Case for 10 Sec.)	260°C

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

		Characteristic	T100 Min	T100 Typ	T100 Max	T300 Min	T300 Typ	T300 Max	Unit	TEST CONDITIONS All characteristics (unless otherwise specified) are measured in Test Configuration with V_{in} = 100 mV (RMS), f = 1 kHz, C_c = 10 pF, V_{DD} = 1.3 V, R_L = 1 MEG Ω
1	STATIC	BV_{DSS} Drain-Source (Drain-Gate) Breakdown[1]	30			30			V	I_D = 1 μA, V_{IN} = 0, C_c Shorted
2	STATIC	I_D Operating Drain Current Range	10		50	70		350	μA	V_{IN} = 0, C_c Shorted
3	STATIC	R_{in} Input Resistance[2]	200M	5G		200M	5G		Ω	V_{IN} = 100 mV DC Measurement, C_c Shorted
4	STATIC	R_{out} Output Resistance	1500		3500	500		1300	Ω	V_{IN} = 0, C_c Shorted
5	DYNAMIC	A_V Voltage Gain	0.40	0.60		0.30	0.45		V/V	
6	DYNAMIC	THD Total Harmonic Distortion		1.0			1.0		%	
7	DYNAMIC	e_{out} Broadband Output Noise Voltage			4.0			2.0	μV	V_{IN} = 0, f = 10 Hz to 10 kHz, C_c Shorted
8	DYNAMIC	C_{in} Input Capacitance		3.0	4.0		3.0	4.0	pF	V_{DD} 20 V, V_{IN} 0,
9	DYNAMIC	C_{out} Output Capacitance		4.4	6.0		4.4	6.0		f = 1 MHz, C_c Shorted
			NYFC			NYFA				

NOTES:
1. Drain-Gate Breakdown Guaranteed by Drain-Source Breakdown Test.
2. M = 10^6, G = 10^9.

APPLICATIONS

Basic JFET Source Follower Equations are:

$$I_D = I_{DSS}\left(1 - \frac{V_{GS}}{V_P}\right)^2 \quad (1)$$

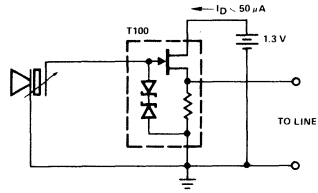
where $V_{GS} = -I_D R_S$ (2)

$$g_{fs} = \frac{-2 I_{DSS}}{V_P}\left(\frac{I_D}{I_{DSS}}\right)^{1/2} \quad (3)$$

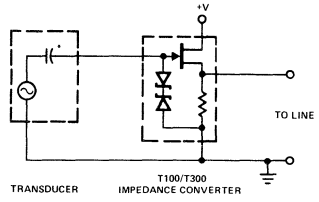
$$R_{OUT} = \frac{R_S}{1 + g_{fs} R_S} \quad (4)$$

$$A_V = g_{fs} R_{OUT} \quad (5)$$

T100 as a Micropower Preamplifier – As in a Hearing Aid Input

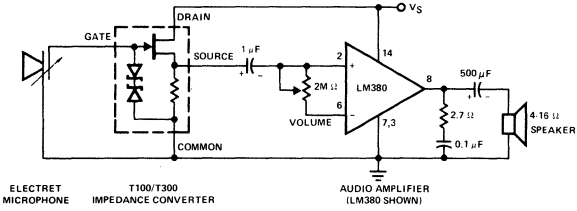


T100/T300 as an Impedance Converter for Transducer Input

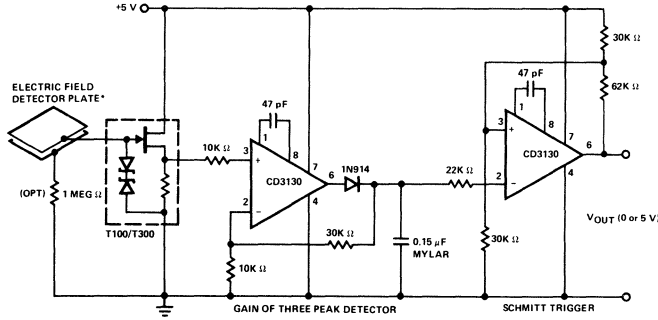


*NO CAPACITOR ISOLATION IS REQUIRED FOH CAPACITIVE TRANSDUCERS OR HIGH-IMPEDANCE PURE VOLTAGE SOURCES.

T100/T300 as a Preamplifier in a Microphone Amplifier Circuit



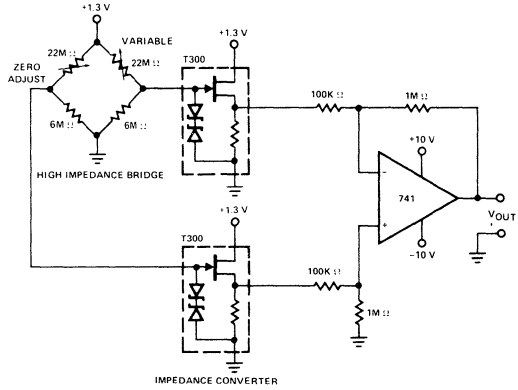
T100/T300 as a Self-Biased Proximity Sensor Works on Detected Changing Field



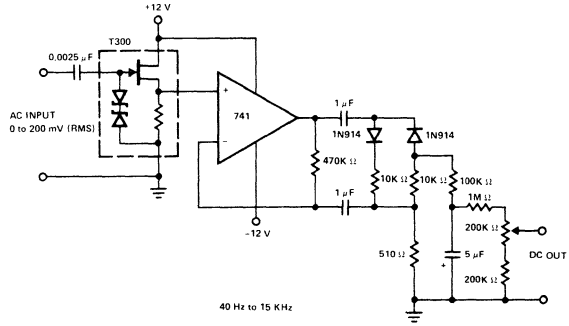
*DETECTOR PLATE MAY BE DOUBLE-SIDED PC BOARD OR ANY INSULATED METAL SHEET

APPLICATIONS (Cont'd)

T300's as Low Signal Level, High Impedance Instrumentation Amplifier



T100 in a High Impedance Precision Rectifier for AC/DC Converter



Source Follower with Voltage Gain Typically Greater Than 0.95 V/V and Z_{OUT} Typically Less Than 60 Ω