

# Audio amplifier

- SELF-CENTERING BIAS
- LOW QUIESCENT CURRENT
- LOW CROSS-OVER DISTORTION
- HIGH INPUT IMPEDANCE
- HIGH EFFICIENCY
- SPECIAL PACKAGE

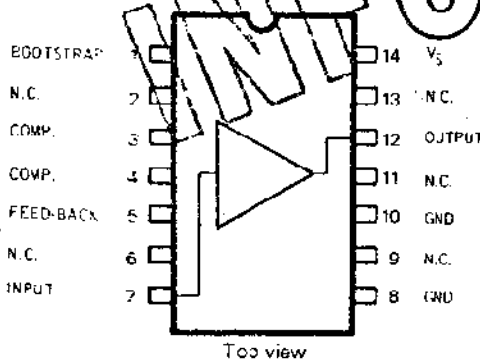
The TAA 611/B is a monolithic integrated circuit particularly designed for use in radio receiver, record player and portable TV set as audio amplifier. The usable range of supply voltage is very high (from 4.5V to 12V). Special features of the circuit include a low quiescent current and self centering bias for operation at any voltage from 4.5 to 12V. The circuit requires a minimum number of external components and the input is direct coupled. The package is a special plastic DIP with a copper bar inserted in the plastic which allows to obtain a low thermal resistance.

### ABSOLUTE MAXIMUM RATINGS (Note 1)

Max Operating Supply Voltage	15 V
Max Supply Voltage (no signal)	18 V
Power Dissipation (T <sub>a</sub> = 50°C)	0.675 W (see note 2)
Input Voltage	-0.5 to 1.5 V <sub>p</sub>
Peak Output Current	1 A
Storage Temperature	-25 to 125°C
Operating Temperature Range	(see note 2)
Junction Temperature	125°C

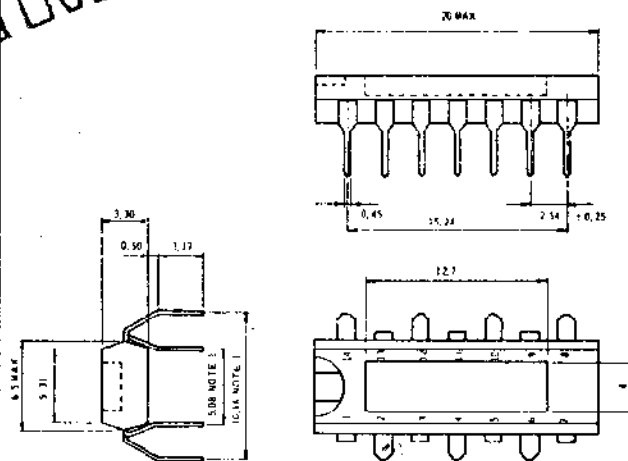
Notes on page 2

CONNECTION DIAGRAM

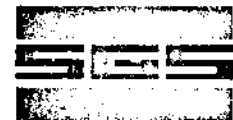


PHYSICAL DIMENSIONS

Power Plastic Split-Dip  
External Slug



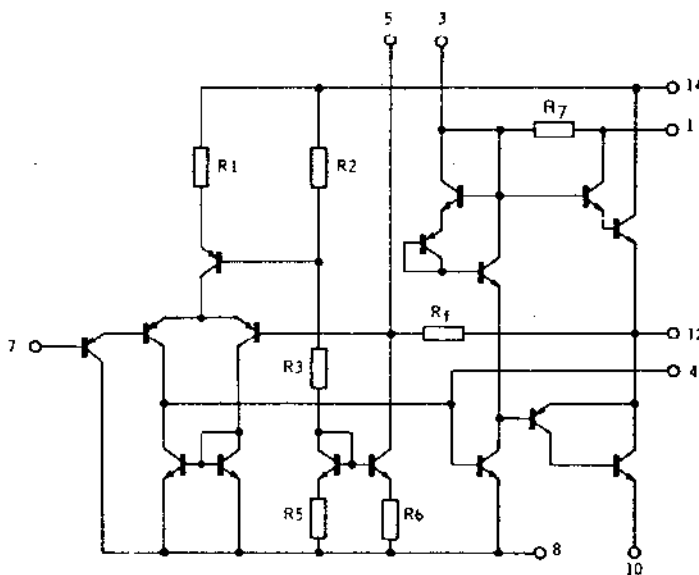
Notes: 1) Leads are intended for insertion in hole tops, 5.08 and 10.16 centre.  
2) All dimensions in mm.



## TYPICAL ELECTRICAL CHARACTERISTICS (note 1)

PARAMETER	CONDITIONS	$V_S = 9V$	$V_S = 11V$	UNIT
Total Current	$V_7 = V_8 = V_{10} = 0$	4	5.2	mA
Quiescent Current of Output Transistors	$V_7 = V_8 = V_{10} = 0$	0.75	1.1	mA
Input Bias Current	$V_7 = V_8 = V_{10} = 0$	40	70	nA
DC Output Voltage	$V_7 = V_8 = V_{10} = 0$	4.8	5.9	V
Open Loop Voltage Gain	$R_L = 8 \text{ OHM}$	68	71	dB
Closed Loop Voltage Gain	Test Circuit 1, $R_L = 8 \text{ OHM}$ , $f_s = 1 \text{ KHz}$ , $P_{out} = 50 \text{ mW}$	34	34	dB
	Test Circuit 2, $R_L = 8 \text{ OHM}$ , $f_s = 1 \text{ KHz}$ , $P_{out} = 50 \text{ mW}$	48	48	dB
Output Voltage	$f_s = 1 \text{ KHz}$ , $R_L = 8 \text{ OHM}$ , THD = 10%	3.02	3.75	Vr.m.s.
Total Harmonic Distortion	Test Circuit 1, $R_L = 8 \text{ OHM}$ , $f_s = 1 \text{ KHz}$ , $P_{out} = 50 \text{ mW}$	0.7	0.35	%
	Test Circuit 1, $R_L = 8 \text{ OHM}$ , $f_s = 1 \text{ KHz}$ , $P_{out} = 1 \text{ W}$	4	0.23	%
	Test Circuit 2, $R_L = 8 \text{ OHM}$ , $f_s = 1 \text{ KHz}$ , $P_{out} = 50 \text{ mW}$	1.7	1.57	%
	Test Circuit 2, $R_L = 8 \text{ OHM}$ , $f_s = 1 \text{ KHz}$ , $P_{out} = 1 \text{ W}$	5.25	1.13	%
Signal to Noise Ratio	Test Circuit 1, $R_L = 8 \text{ OHM}$ , $f_s = 1 \text{ KHz}$ , $P_{out} = 1 \text{ W}$ , $R_S = 220 \text{ K}$	75	75	dB
	Test Circuit 2, $R_L = 8 \text{ OHM}$ , $f_s = 1 \text{ KHz}$ , $P_{out} = 1 \text{ W}$ , $R_S = 20 \text{ K}$	75	75	dB
Input Impedance	Open Loop	0.75	0.75	M OHM
$R_f$ (see electrical diagram)		7.5	7.5	K OHM
$R_{th j-a}$		97	97	$^{\circ}\text{C/W}$
$R_{th j-c}$		17	17	$^{\circ}\text{C/W}$

## ELECTRICAL DIAGRAM



## NOTES :

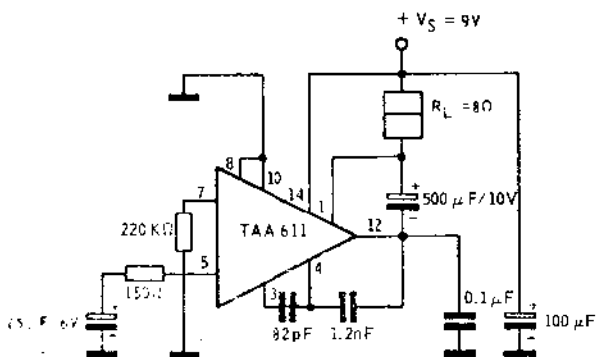
- (1) Ambient temperature  $T_A = 25^{\circ}\text{C}$  unless otherwise noted.
- (2) Refer to "MAX ALLOWABLE  $P_D$  VERSUS  $T_A$ " at page 3.

OUTPUT POWER AS A FUNCTION OF THE SUPPLY VOLTAGE AND OF THE LOADING CONDITIONS

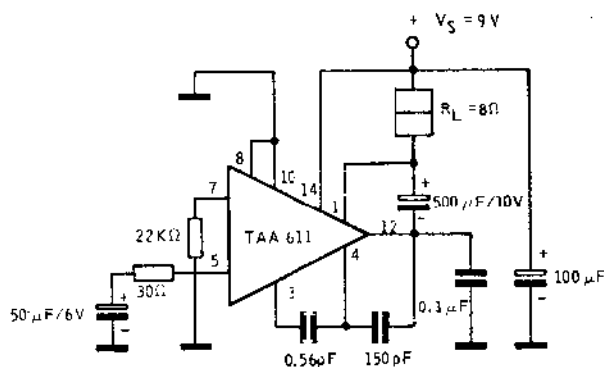
(Typical values at ambient temperature  $T_A = 25^\circ\text{C}$ )

$V_S$ (V)	$R_L$ (OHM)	Pout (W) at Clipping	Pout (W) THD = 10%
6	4	0.5	0.65
	8	0.35	0.46
9	8	0.9	1.15
11	8	1.4	1.8
12	8	1.7	2

TEST CIRCUIT 1 ( $A_V = 50$ )

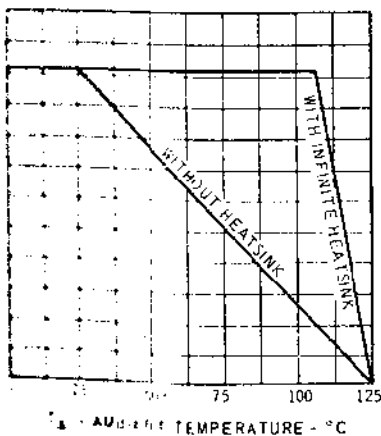


TEST CIRCUIT 2 ( $A_V = 250$ )

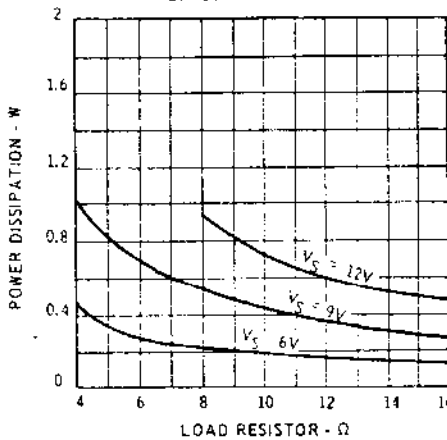


TYPICAL ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

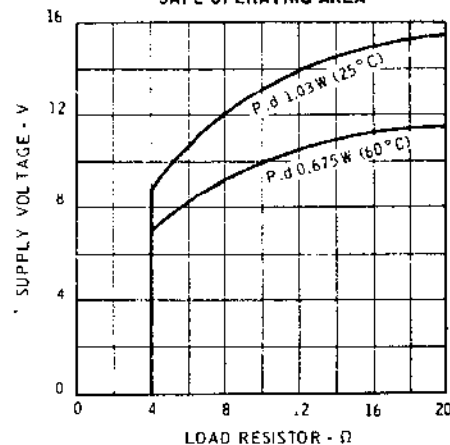
MAX ALLOWABLE POWER DISSIPATION VERSUS AMBIENT TEMPERATURE



MAX POWER DISSIPATED BY THE CIRCUIT (TYPICAL VALUES) VERSUS LOAD RESISTOR

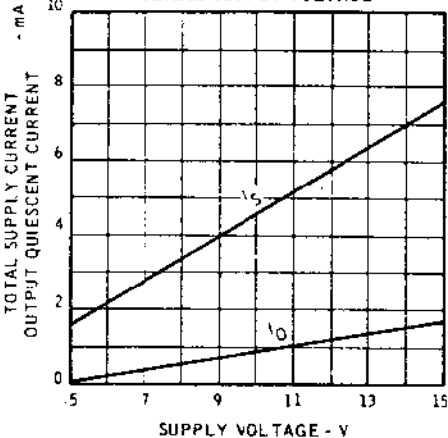


SAFE OPERATING AREA

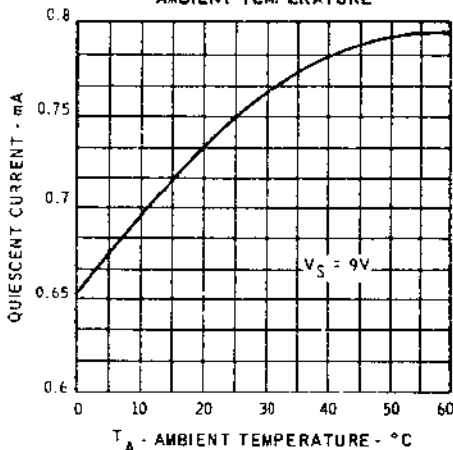


TYPICAL ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

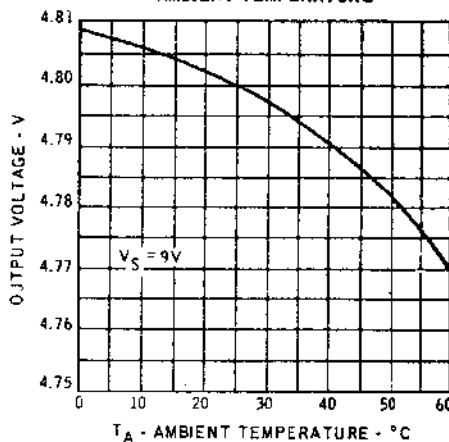
TOTAL SUPPLY CURRENT AND OUTPUT QUIESCENT CURRENT VERSUS SUPPLY VOLTAGE



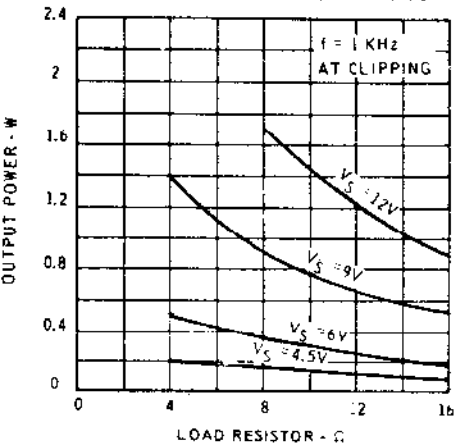
QUIESCENT CURRENT OF OUTPUT TRANSISTORS VERSUS AMBIENT TEMPERATURE



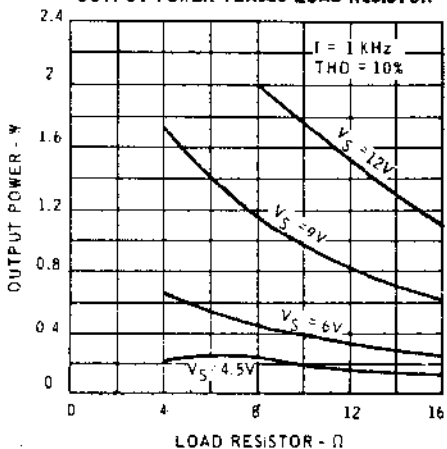
D.C. OUTPUT LEVEL VERSUS AMBIENT TEMPERATURE



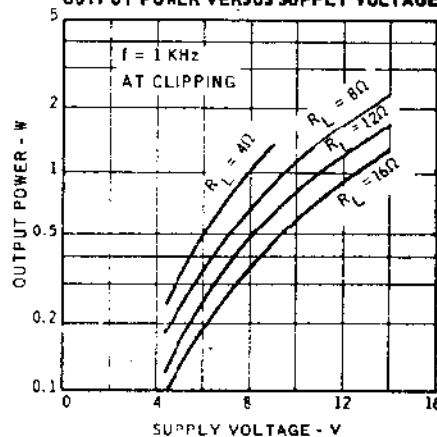
OUTPUT POWER VERSUS LOAD RESISTOR



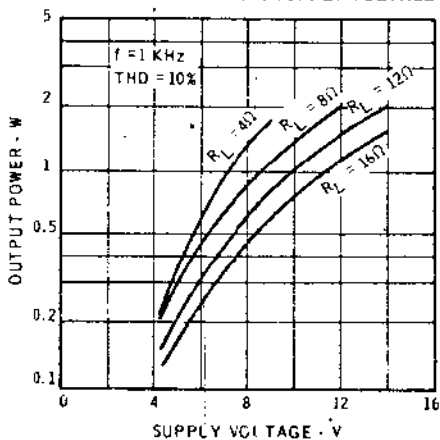
OUTPUT POWER VERSUS LOAD RESISTOR



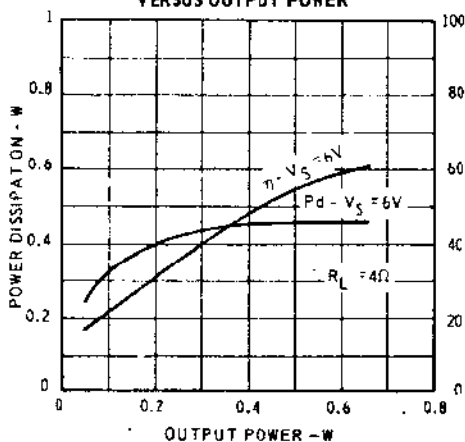
OUTPUT POWER VERSUS SUPPLY VOLTAGE



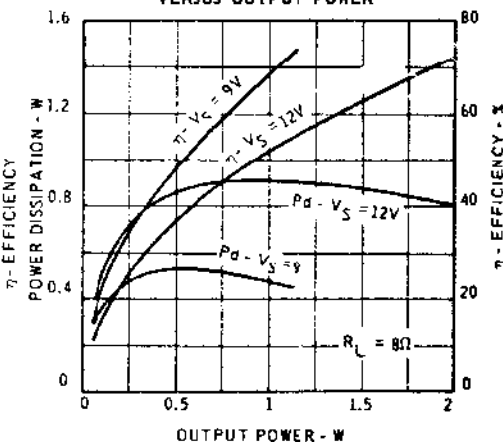
OUTPUT POWER VERSUS SUPPLY VOLTAGE



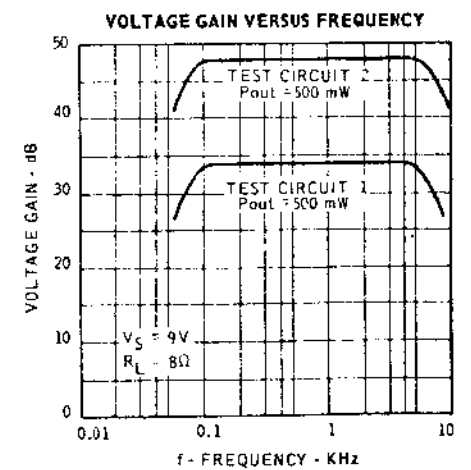
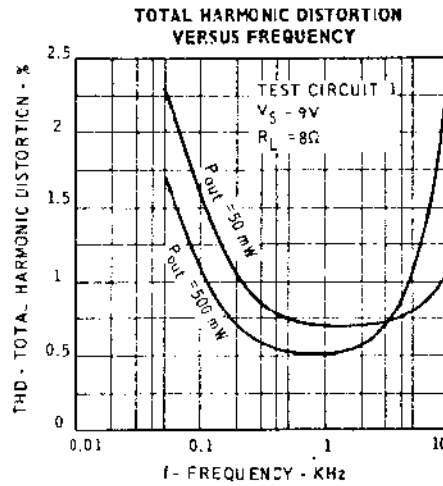
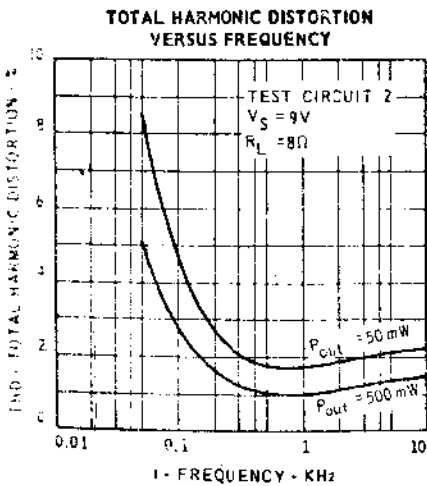
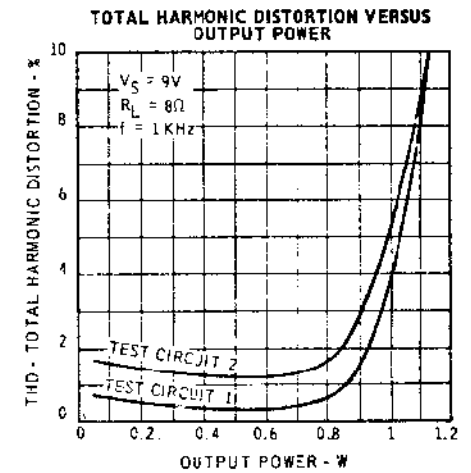
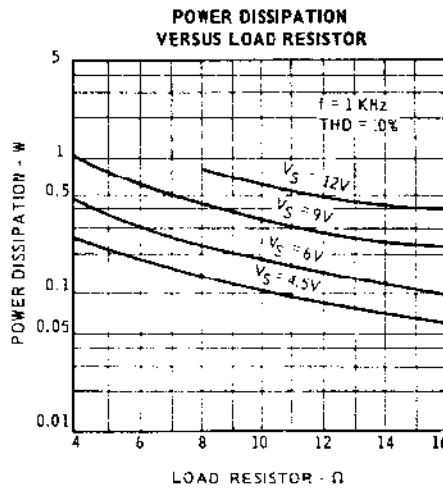
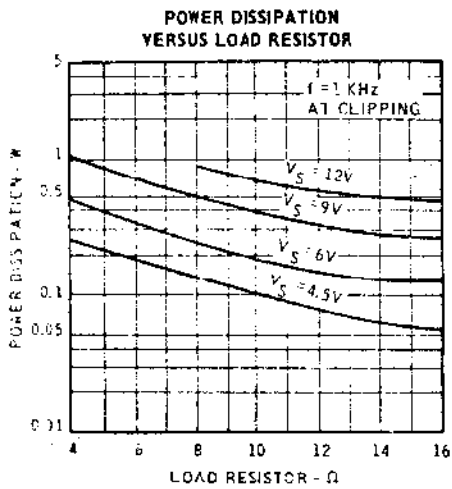
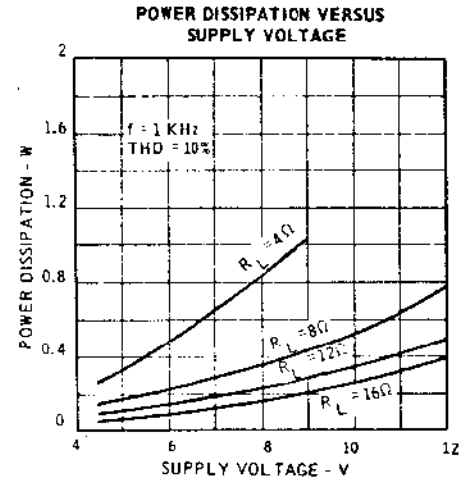
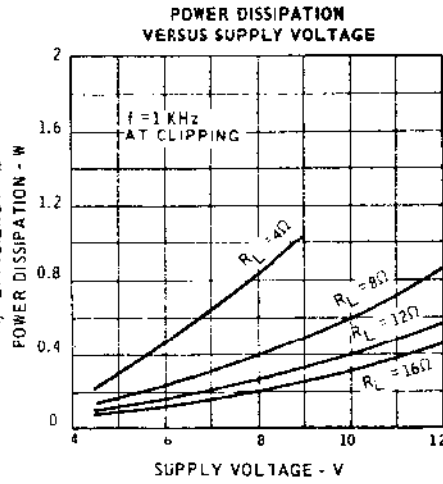
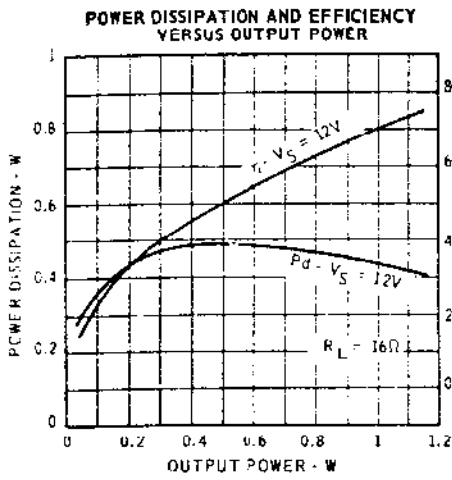
POWER DISSIPATION AND EFFICIENCY VERSUS OUTPUT POWER



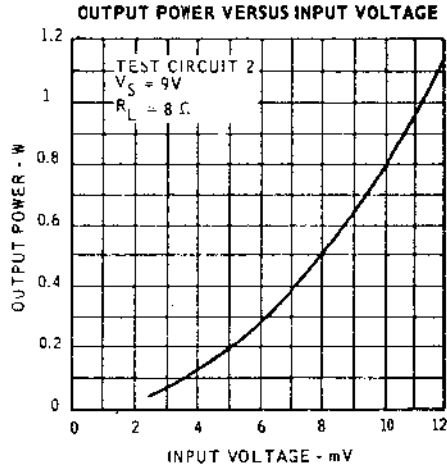
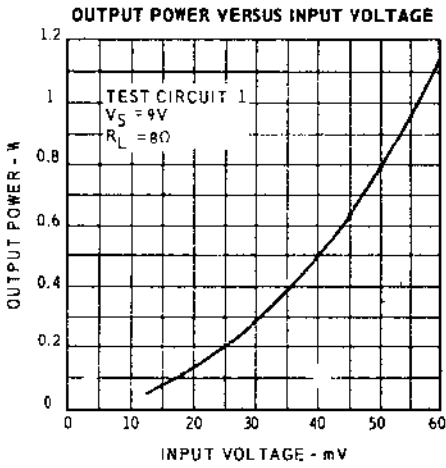
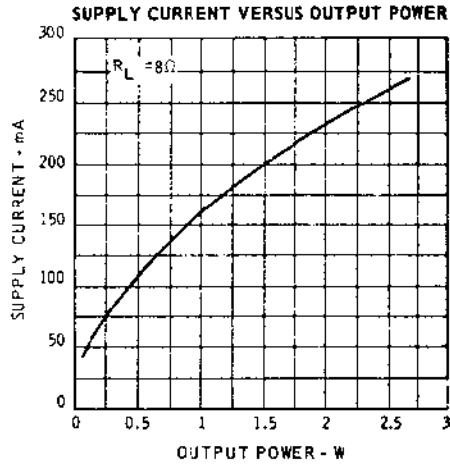
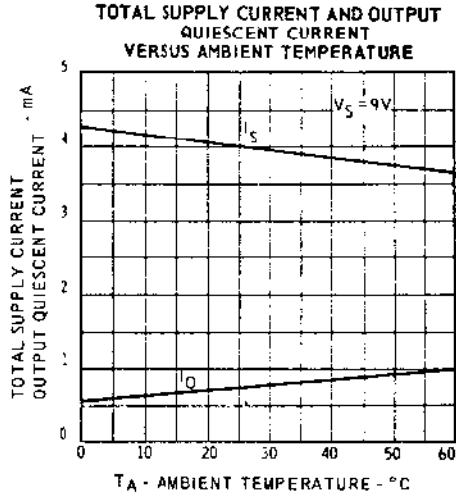
POWER DISSIPATION AND EFFICIENCY VERSUS OUTPUT POWER



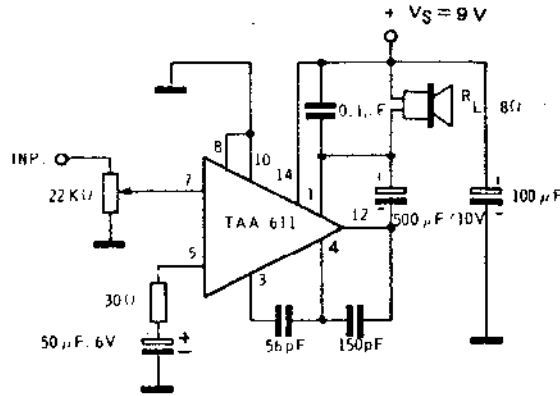
TYPICAL ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)



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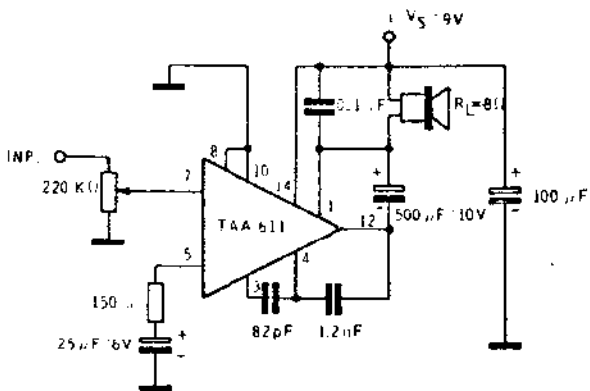
TYPICAL APPLICATION : AUDIO AMPLIFIER FOR RADIO RECEIVER



ELECTRICAL CHARACTERISTICS OF THE AMPLIFIER

Supply Voltage		9 V
Voltage Gain		48 dB
Sensitivity	$\left\{ \begin{array}{l} P_O = 50 \text{ mW} \\ P_O = 1 \text{ W} \end{array} \right.$	2.5 mV r.m.s.
		11.3 mV r.m.s.
Frequency Response	-3 dB	50 to 15 KHz
Total Current	$\left\{ \begin{array}{l} P_O = 0 \\ P_O = 1 \text{ W} \end{array} \right.$	4 mA
		160 mA
Max Output Power	THD = 10%; $f_s = 1 \text{ KHz}$	1.1 W
Distortion	$P_O = 50 \text{ mW}; f_s = 1 \text{ KHz}$	1.7%
Efficiency	$P_O = 1 \text{ W}$	70%
Noise Voltage at the Input	$R_S = 51 \text{ OHM}; \text{BW} = 15 \text{ KHz}$	5 $\mu\text{V}$
DC Output Voltage	$R_S = 0 \div 20 \text{ KOHM}$	4.8 V
Supply Voltage Rejection (at the input)		54 dB

TYPICAL APPLICATION : AUDIO AMPLIFIER FOR RECORD-PLAYER



ELECTRICAL CHARACTERISTICS OF THE AMPLIFIER

Supply Voltage		9 V
Voltage Gain		34 dB
Sensitivity	$\left\{ \begin{array}{l} P_O = 50 \text{ mW} \\ P_O = 1 \text{ W} \end{array} \right.$	12.6 mV r.m.s.
		57 mV r.m.s.
Frequency Response	-3 dB	50 to 15 KHz
Total Current	$\left\{ \begin{array}{l} P_O = 0 \\ P_O = 1 \text{ W} \end{array} \right.$	4 mA
		160 mA
Max Output Power	THD = 10%; $f_S = 1 \text{ KHz}$	1.1 W
Distortion	$P_O = 50 \text{ mW}; f_S = 1 \text{ KHz}$	0.7%
Efficiency	$P_O = 1 \text{ W}$	70%
Noise Voltage at the Input	$R_S = 51 \text{ OHM}; \text{BW} = 15 \text{ KHz}$	5 $\mu\text{V}$
DC Output Voltage	$R_S = 0 + 20 \text{ KOHM}$	4.8 V
Supply Voltage Rejection (at the input)		40 dB