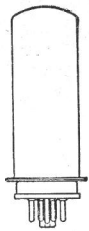

Sylvania

TYPE 6L6

POWER AMPLIFIER

CHARACTERISTICS

Heater Voltage AC or DC	6.3 Volts
Heater Current	0.9 Ampere
Maximum Over-all Length	4 $\frac{1}{16}$"
Maximum Diameter	1 $\frac{5}{8}$"
Base—Octal 7-Pin	7-AC

Static and Dynamic Characteristics:

Heater Voltage	6.3 Volts
Plate Voltage	250 Volts
Screen Voltage	250 Volts
Grid Voltage	−14 Volts
Plate Current	72 Ma.
Screen Current	5 Ma.
Plate Resistance	22500 Ohms
Mutual Conductance	6000 μmhos
Amplification Factor	135

Operating Conditions and Characteristics:

CLASS A1 AMPLIFIER (One Tube)

Heater Voltage°	6.3		6.3		6.3		6.3	Volts
Plate Voltage	375		250		300		375	Volts Max.
Screen Voltage	125		250		200		250	Volts Max.
Plate and Screen Dissipation*	...		...		...		24	Watts Max.
Screen Dissipation	...		...		...		3.5	Watts Max.
Bias	Fixed	Self	Fixed	Self	Fixed	Self	Fixed	
Grid Voltage†	−9	−9‡	−14	−13.5‡	−12.5	−11.8‡	−17.5	Volts
Peak Input Signal	8	8.5	14	14	12.5	12.5	17.5	Volts
Plate Current Z	24	24	72	75	48	51	57	Ma.
Plate Current M	26	24.3	79	78	55	54.5	67	Ma.
Screen Current Z	0.7	0.6	5	5.4	2.5	3.0	2.5	Ma.
Screen Current M	1.8	2	7.3	7.2	4.7	4.6	6	Ma.
Load Resistance	14000		2500		4500		4000	Ohms
Total Distortion	9		10		11		14.5	Per Cent
2nd Harmonic	8		9.7		10.7		13.5	Per Cent
3rd Harmonic	4		2.5		2.5		4.2	Per Cent
Power Output M	4.2	4	6.5		6.5		11.5	Watts

Z Zero Signal, M Maximum Signal.
°, *, †, ‡, See Circuit Application.

CLASS A1 AMPLIFIER (Push-Pull)
Values are for two tubes

	Fixed Bias	Self Bias	
Heater Voltage°	6.3	6.3	Volts
Plate Voltage	250	250	Volts Max.
Screen Voltage	250	250	Volts Max.
Plate and Screen Dissipation*	...	24	Watts Max.
Screen Dissipation	...	3.5	Watts Max.
Grid Voltage†	−16	−16‡	Volts
Peak Input Signal (Grid to Grid)	32	35.6	Volts
Plate Current (Zero Signal)	120	120	Ma.
Plate Current (Max Signal)	140	130	Ma.
Screen Current (Zero Signal)	10	10	Ma.
Screen Current (Max. Signal)	16	15	Ma.
Load Resistance (Plate to Plate)	5000	5000	Ohms
Total Harmonic Distortion	2	2	Per Cent
3rd Harmonic	2	2	Per Cent
Power Output (Max. Signal)	14.5	13.8	Watts

°, *, †, ‡, See Circuit Application.

CLASS AB1 AMPLIFIER (Push-Pull)
Values are for two tubes

Heater Voltage°	6.3		6.3		6.3		6.3	Volts
Plate Voltage	400		400		400		400	Volts Max.
Screen Voltage	250		250		300		300	Volts Max.
Plate and Screen Dissipation*	...		...		...		24	Watts Max.
Screen Dissipation	...		...		...		3.5	Watts Max.
Bias	Fixed	Fixed	Self	Fixed	Self	Fixed		
Grid Voltage†	−20	−20	−19‡	−25	−23.5‡	−25	Volts
Peak Input Signal G	40	40	43.8	50	57	50	Volts
Plate Current Z	88	88	96	100	112	102	Ma.
Plate Current M	126	124	110	152	128	156	Ma.
Screen Current Z	4	4	4.6	5	6	5	Ma.
Screen Current M	9	12	10.8	17	16	12	Ma.

(Continued)

CLASS AB1 AMPLIFIER (Push-Pull)–Continued

Bias	Fixed	Fixed Self	Fixed	Self	Fixed
Load Resistance P	6000	8500	6600		3800 Ohms
Total Distortion	1	2	2		0.6 Per Cent
3rd Harmonic	1	2	2		0.6 Per Cent
Power Output M	20	26.5 24	34	30	23 Watts

G Grid to Grid, Z Zero Signal, M Maximum Signal, P Plate to Plate.

°, *, †, ‡, See Circuit Application.

CLASS AB2 AMPLIFIER (Push-Pull)
Values are for two tubes

	Fixed Bias	Fixed Bias
Heater Voltage°	6.3	6.3 Volts
Plate Voltage	400	400 Volts Max.
Screen Voltage	250	300 Volts Max.
Plate and Screen Dissipation*	...	24 Watts Max.
Screen Dissipation	...	3.5 Watts Max.
Grid Voltage†	−20	−25 Volts
Peak Input Signal (Grid to Grid)	57	80 Volts
Plate Current (Zero Signal)	88	102 Ma.
Plate Current (Max. Signal)	168	230 Ma.
Screen Current (Zero Signal)	4	6 Ma.
Screen Current (Max. Signal)	13	20 Ma.
Load Resistance (Plate to Plate)	6000	3800 Ohms
Peak Input Power¶	180	350 Milliwatts
Total Harmonic Distortion+	2	2 Per Cent
3rd Harmonic+	2	2 Per Cent
Power Output (Max. Signal)	40	60 Watts

°, *, †, ¶, +, See Circuit Application.

CIRCUIT APPLICATION

Sylvania Type 6L6 is an all-metal power amplifier tube designed for use in the output stage of radio receivers, particularly in those designed to have a reserve of power capability. The tube provides high power output, power sensitivity and efficiency, with low percentage of third and higher order harmonics.

New design principles, responsible for the above features, involve the use of directed electron beams. These effects are produced by arranging the tube elements in such a manner that potential fields are set up which confine the electrons into beams of high density. Efficient suppressor action is produced by the space-charge effects formed between the screen and plate. Very little power is taken by the screen.

The second harmonic distortion is intentionally high in order to reduce the third and higher order harmonics to a minimum. Elimination of the second harmonic distortion can be obtained by using Type 6L6 tubes in a push-pull arrangement. If only one tube is used in a resistance coupled circuit, second harmonics can be reduced by generating out-of-phase second harmonics in preceding audio stages.

It is recommended that circuits be used which avoid the effects of loud speaker resonance and variable impedance.

Additional information pertaining to the reference marks which appear in the various tabulations of ratings and operation characteristics for Type 6L6 is given below:

The number "1" used in conjunction with the terms Class A and Class AB indicates that no grid current flows during any part of the input cycle. Likewise, the number "2" indicates that grid current does flow during some part of the input cycle.

° The heater voltage rating for Type 6L6 is 6.3 volts. Precautions should be taken to prevent the heater voltage from exceeding a maximum value of 7.0 volts during line voltage fluctuations. A minimum potential difference between heater and cathode should be maintained.

* The maximum plate and screen dissipation must not be exceeded. Provision should be made for line voltage changes, especially when fixed-bias operation is employed.

‡ Indicates zero signal.

† Transformer or impedance coupling devices are recommended and the resistance introduced in the grid circuit should be kept as low as possible. For fixed bias this resistance should not exceed 0.1 megohm. The maximum grid circuit resistance when self-bias is employed may be 0.25 megohm if the heater voltage does not exceed 7.0 volts. See first note above.

+ The plate circuit distortion does not exceed 2% with a zero impedance driver.

¶ For Class AB operation the driver stage should be designed so as to be capable of supplying the required peak power with low distortion to the grids of the output stage.