# CBS tubes

# technical information

## TENTATIVE DATA

## E235L/7751

The E235L is a reliable beam power pentode with long life (over 10,000 hours). Its characteristics are held to narrow limits and the cathode is free from interface formation.

This tube has low internal resistance at zero grid bias, and it is especially designed as a switching tube for pulsed equipment, as a pass tube in regulated power supplies, and other power tube applications (especially for low anode and screen grid voltages).

## MECHANICAL DATA

| | |
|---|---|
| Cathode, coated unipotential | |
| Base | Octal |
| Maximum overall height | 4.14 inches |
| Maximum seated height | 3.38 inches |
| Maximum diameter | 1.3 inches |
| Mounting position | Any |

### PIN CONNECTIONS 7AC

| | | | |
|---|---|---|---|
| Pin 1: | N.C. | Pin 5: | Grid 1 |
| Pin 2: | Heater | Pin 6: | N.C. |
| Pin 3: | Plate | Pin 7: | Heater |
| Pin 4: | Grid 2 | Pin 8: | Cathode, Grid 3 |

## ELECTRICAL DATA

### HEATER CHARACTERISTICS

| | | |
|---|---|---|
| Heater voltage | 6.3 | volts |
| Heater current | 1.2 | amps |
| Peak heater-cathode voltage | | |
| Heater negative to cathode | 200 | volts |
| Heater positive to cathode | 250 | volts |

from JEDEC release #2840,
June 13, 1960

## DIRECT INTERELECTRODE CAPACITANCES

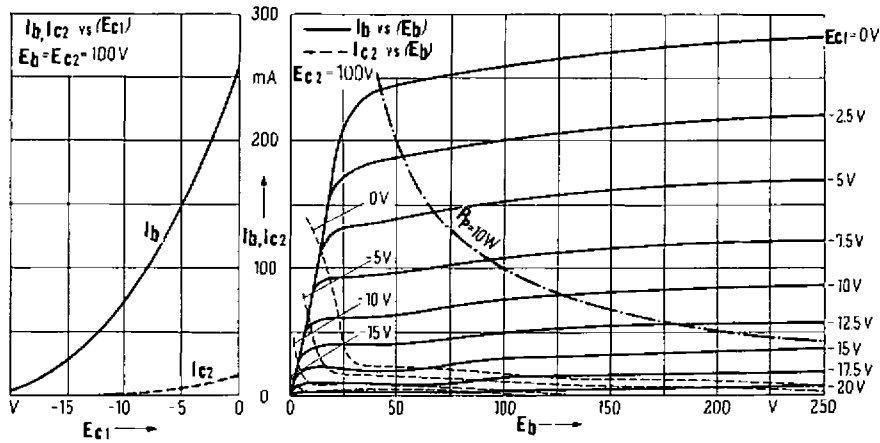| | | |
|---|---|---|
| Input | 17.5 | μμf |
| Output | 9.0 | μμf |
| Grid 1 to plate, max. | 1.3 | μμf |

## MAXIMUM RATINGS (Absolute maximum values)

| | | |
|---|---|---|
| Plate supply voltage, zero plate current | 550 | volts |
| Plate voltage, d-c | 250 | volts |
| Grid 2 supply voltage, zero grid current | 550 | volts |
| Grid 2 voltage, d-c | 250 | volts |
| Plate dissipation | 10 | watts |
| Grid 2 dissipation | 5 | watts |
| Plate and grid 2 total dissipation | 13 | watts |
| Cathode current | 200 | ma |
| Grid 1 circuit resistance | 0.5 | meg |
| Heater-Cathode external resistance | 20,000 | ohms |
| Bulb temperature | 220 | °C |

## CHARACTERISTICS

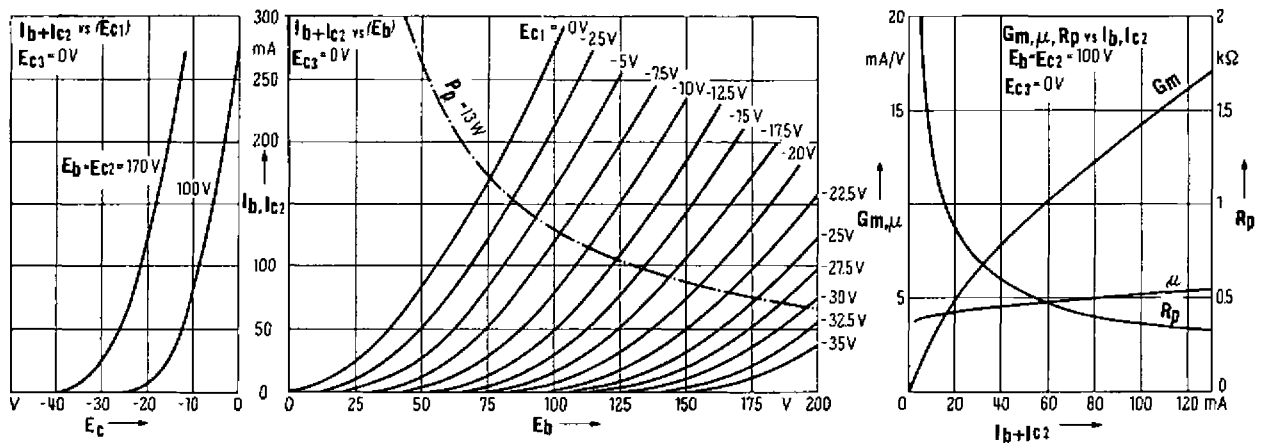| | | |
|---|---|---|
| Plate supply voltage | 100 | volts |
| Grid 2 voltage, zero signal | 100 | volts |
| Grid 1 voltage | -8.2 | volts |
| Plate current | 100 | ma |
| Grid 2 current | 7.0 | ma |
| Transconductance | 14,000 | μmhos |
| Plate resistance | 5,000 | ohms |
| Grid 2 amplification factor | 5.6 | --- |
| Internal resistance, zero grid bias | 100 | ohms |
| Plate current, Ec1 = -35V (approx.) | 0.1 | ma |

**TRANSFER CHARACTERISTICS**

**PLATE CHARACTERISTICS**

$I_b, I_{c2}$ vs $(E_{c1})$
$E_b = E_{c2} = 100V$

$I_b$

$I_{c2}$

300 mA

200

100

0

$I_b, I_{c2}$

V  -15  -10  -5  0

$E_{c1}$ ⟶

$I_b$ vs $(E_b)$
$I_{c2}$ vs $(E_b)$
$E_{c2} = 100V$

$E_{c1} = 0V$
-2.5 V
-5 V
-7.5 V
-10 V
-12.5 V
-15 V
-17.5 V
-20 V

0V
-5V
-10V
-15V

$P_p = 10W$

0  50  100  150  200  250

$E_b$ ⟶

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**\*TRANSFER CHARACTERISTICS**

**\*PLATE CHARACTERISTICS**

**\*CHARACTERISTICS**

$I_b + I_{c2}$ vs $(E_{c1})$
$E_{c3} = 0V$

$E_b = E_{c2} = 170V$

100V

300 mA
250
200
150
100
50
0

$I_b, I_{c2}$

V  -40  -30  -20  -10  0

$E_c$ ⟶

$I_b + I_{c2}$ vs $(E_b)$
$E_{c3} = 0V$

$E_{c1} = 0V$  -2.5V
-5V
-7.5V
-10V  -12.5V
-15 V
-17.5V
-20V
-22.5 V
-25V
-27.5 V
-30 V
-32.5 V
-35V

$P_p = 13W$

0  25  50  75  100  125  150  175  V  200

$E_b$ ⟶

$G_m, \mu, R_p$ vs $I_b, I_{c2}$
$E_b = E_{c2} = 100V$
$E_{c3} = 0V$

$G_m$

$\mu$

$R_p$

20 mA/V
15
10
5
0

$G_m, \mu$

2 kΩ
1.5
1
0.5
0

$R_p$

0  20  40  60  80  100  120 mA

$I_b + I_{c2}$ ⟶

**\*TRIODE CONNECTED**