

## SHARP-CUTOFF TRIODE 2HM5, 3HM5, 4HM5 AND 6HM5

The 2HM5, 3HM5, 4HM5 and 6HM5 are sharp-cutoff, seven-pin miniature triode types designed particularly for service in V.H.F. television tuners as grounded cathode r-f amplifiers. These types are electrically and mechanically similar to the 2HA5, 3HA5, 4HA5 and 6HA5 except for bulb length.

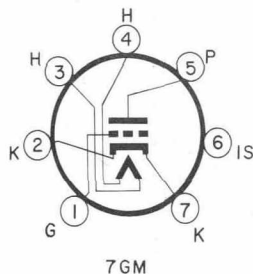
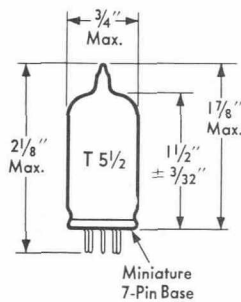
The 2HM5, 3HM5 and 4HM5 have been designed for use in receivers which employ series connected heaters, especially in television receivers where the picture-tube heater is in series with other heaters. When each is employed in this type of circuit with other tubes similarly designed having the same heater current rating, heater voltage surges across individual tubes are minimized inasmuch as heater warm-up characteristic is controlled.

### ELECTRICAL

| Heater Characteristics:                                | 2HM5      | 3HM5 | 4HM5 | 6HM5  |                  |
|--------------------------------------------------------|-----------|------|------|-------|------------------|
| Voltage (ac or dc) . . . . .                           | 2.4       | 2.9  | 4.0  | 6.3   | Volts            |
| Current . . . . .                                      | 0.60      | 0.45 | 0.30 | 0.185 | Ampere           |
| Warm-up Time (Note 1) . . . . .                        | 11        | 11   | 11   | —     | Seconds          |
| Direct Interelectrode Capacitance: (Shielded) (Note 2) |           |      |      |       |                  |
| Grid to Plate . . . . .                                | 0.34 max. |      |      |       | $\mu\mu\text{f}$ |
| Input . . . . .                                        | 4.5       |      |      |       | $\mu\mu\text{f}$ |
| Output . . . . .                                       | 3.0       |      |      |       | $\mu\mu\text{f}$ |
| Heater to Cathode . . . . .                            | 2.5       |      |      |       | $\mu\mu\text{f}$ |

### MECHANICAL

|                             |                              |
|-----------------------------|------------------------------|
| Cathode . . . . .           | Coated Unipotential          |
| Bulb . . . . .              | T-5½                         |
| Base . . . . .              | Miniature 7-Pin (JEDEC E7-1) |
| Outline . . . . .           | 5-2                          |
| Basing . . . . .            | 7GM                          |
| Mounting Position . . . . . | Any                          |



### RATINGS

#### Design Maximum Values

|                                               |          |        |
|-----------------------------------------------|----------|--------|
| Plate Voltage . . . . .                       | 200 max. | Volts  |
| Plate Dissipation . . . . .                   | 2.6 max. | Watts  |
| Grid Voltage:                                 |          |        |
| Negative Value . . . . .                      | 50 max.  | Volts  |
| Cathode Current . . . . .                     | 20 max.  | Ma.    |
| Grid Circuit Resistance (Self Bias) . . . . . | 1.0 max. | Megohm |

#### Heater Ratings:

##### Allowable Heater

| Voltage:          | 2HM5 | 3HM5 | 4HM5 | 6HM5     |       |
|-------------------|------|------|------|----------|-------|
| Maximum . . . . . | —    | —    | —    | 6.9 max. | Volts |
| Minimum . . . . . | —    | —    | —    | 5.7 min. | Volts |

##### Allowable Heater Current:

|                   |     |     |     |        |     |
|-------------------|-----|-----|-----|--------|-----|
| Maximum . . . . . | 640 | 480 | 320 | — max. | Ma. |
| Minimum . . . . . | 560 | 420 | 280 | — min. | Ma. |

#### Heater-Cathode Voltage:

|                                 |     |     |     |          |       |
|---------------------------------|-----|-----|-----|----------|-------|
| Heater Negative with Respect to |     |     |     |          |       |
| Cathode DC . . . . .            | 100 | 100 | 100 | 100 max. | Volts |
| Heater Positive with Respect to |     |     |     |          |       |
| Cathode DC . . . . .            | 100 | 100 | 100 | 100 max. | Volts |

### CHARACTERISTICS & TYPICAL OPERATION

|                                          |            |            |                  |
|------------------------------------------|------------|------------|------------------|
| Plate Voltage . . . . .                  | 120        | 135        | Volts            |
| Grid Voltage . . . . .                   | 0          | -1         | Volts            |
| Grid Resistance . . . . .                | 0.1        | 0          | Megohm           |
| Transconductance . . . . .               | 18,000     | 14,500     | $\mu\text{mhos}$ |
| Grid Cutoff Bias . . . . .               | See Note 6 | See Note 3 |                  |
| Plate Current . . . . .                  | 15.0       | 12.5       | Ma.              |
| Amplification Factor . . . . .           | 82         | 78         | —                |
| Hot Input Resistance (Note 4) . . . . .  | —          | 1000       | Ohms             |
| Hot Input Capacitance (Note 4) . . . . . | —          | 8.5        | $\mu\mu\text{f}$ |
| Noise Figure (Note 5) . . . . .          | 4.0        | 4.2        | db               |

### NOTES

1. Heater Warm-up Time is defined as the time required for the voltage across the heater to reach 80% of its rated value after applying four times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to three times rated heater voltage divided by rated heater current.
2. With JEDEC shield No. 316 connected to Pin 2.
3. Grid Volts for  $g_m = 150 \mu\text{mhos}$ : -5.7  
Grid Volts for  $g_m = 1500 \mu\text{mhos}$ : -2.7
4. Measured at 200 Mc. with plate at signal ground.  $E_{c1} = -1.5$  Volt.
5. In a 200 Mc. noise-matched, optimized, neutralized, grounded-cathode triode amplifier stage.
6. Grid Volts for  $g_m = 150 \mu\text{mhos}$ : -5.1

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