INCH-POUND

MIL-PRF-1/1580F
8 April 2016
SUPERSEDING
MIL-PRF-1/1580E
29 August 2011

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, POWER
TYPE 8621

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the electron tube described herein shall consist of this document and the latest issue of MIL-PRF-1.

DESCRIPTION: Tetrode, ceramic-metal.

Outline: See figure 1.

Mounting position: Any.

Weight: 4 ounces (113.4 grams) nominal.

ABSOLUTE RATINGS: Class AB1

| Parameter: | F | Ef | Eb | Ec1 | Ec2 | Ehk | Ib |
|---|---|---|---|---|---|---|---|
| Unit: | MHz | V ac | V dc | V dc | V dc | V dc | mA dc |
| Maximum: | 500 | 26.5 ± 5% | 2,000 | -150 | 400 | ±150 | 250 |
| Test conditions: | --- | 26.5 | 1,000 | Adj | 300 | 0 | 150 |

ABSOLUTE RATINGS: Class AB1

| Parameter: | Pg1 | Pg2 | Pp | T(seals and anode core | tk | Cooling |
|---|---|---|---|---|---|---|
| Unit: | W | W | W | °C | sec (min) | 1/ |
| Maximum: | 2 | 12 | 250 | 250 | 30 | --- |
| Test conditions: | --- | --- | --- | --- | 120 | 2/ |

See footnotes at end of table I.

GENERAL:

Qualification: Required.

This specification sheet uses accept on zero defect sampling in accordance with MIL-PRF-1, table III.

TABLE I. Testing and inspection.

| Inspection | Method MIL-STD-1311 | Notes | Conditions | Symbol | Limits Min | Limits Max | Unit |
|---|---|---|---|---|---|---|---|
| Conformance inspection, part 1 | | | | | | | |
| Pulse emission | 2212 | 3/ | Eb = Ec2 = 250 V dc; Ec1 = -100 V dc; egk/ik = 1.5 a; prr = 11 ± 1; tp = 4,500 μs (min); Ef = 23.8 V ac | Δik | --- | 200 | ma |
| Heater current | 1301 | --- | | If | 0.45 | 0.62 | A ac |
| Electrode voltage (grid) | 1261 | --- | Eb = 1,600 V dc; Ec2 = 400 V dc; Ec1/Ib = 100 mA dc | Ec1 | -62.0 | -76.0 | V dc |
| Electrode current (screen) | 1256 | --- | | Ic2 | -7.0 | +3.0 | mA dc |
| Total grid current | 1266 | 4/ | Eb = 2,000 V dc; Ec1/Ib = 125 mA dc | Ic1 | --- | -15 | μA dc |
| Primary grid emission (control) | 1266 | --- | Ic1 = 70 mA dc; t = 120; anode and screen grid floating | Isg1 | --- | -250 | μA dc |
| Primary grid emission (screen) | 1266 | --- | Ec1 = 0; t = 120; Ic2 = 100 mA dc; anode floating | Isg2 | --- | -250 | μA dc |
| Current division (long pulse, method A) | 1372 | --- | Eb = Ec2 = 250 V dc; Ec1 = -100 V dc; egk/ib = 1.0 a; prr = 11 ± 1; tp = 4,500 μs (min) | egk<br>ic1<br>ic2 | 6.0<br>---<br>--- | 18.0<br>200<br>260 | v<br>ma<br>ma |
| Interelement leakage resistance (cold) | 1366 | --- | Supply voltage = 500 V dc; Rs = 2.5 MegΩ; anode positive | Rg2p | 200 | --- | MegΩ |
| Conformance inspection, part 2 | | --- | | | | | |
| Low-frequency vibration | 1031 | --- | No voltages applied | --- | --- | --- | --- |
| Direct-interelectrode capacitance | 1331 | --- | EIA standard shields No. 320 and 321, or equal | Cgp<br>Cin<br>Cout | ---<br>14.2<br>4.0 | 0.06<br>17.2<br>5.3 | pF<br>pF<br>pF |

See footnotes at end of table.

TABLE I. Testing and inspection - Continued.

| Inspection | Method MIL-STD-1311 | Notes | Conditions | Symbol | Limits Min | Limits Max | Unit |
|---|---|---|---|---|---|---|---|
| Conformance inspection, part 2 - Continued | | | | | | | |
| Heater-cathode leakage | 1336 | --- | Ehk = +150 V dc<br>Ehk = -150 V dc | Ihk<br>Ihk | ---<br>--- | 150<br>150 | μA dc<br>μA dc |
| Power output | --- | 5/ | Class AB1 amplifier; F = 1 MHz (min), 30 MHz (max); Eb = 1,600 V dc; Ec2 = 400 V dc; Ec1/Ibo = 100 mA dc; Rℓ = 2,000 ohms; t = 300 (max); Pd = zero level as indicated by Ic1 = 10 μA dc (max) | Po | 250 | --- | W (useful) |
| Conformance inspection, part 3 | | | | | | | |
| Shock | 1042 | --- | Angle = 20°<br>Test condition B | --- | --- | --- | --- |
| Life test | --- | 6/ | Stability; Group C; Ef = 27.8 V ac; Ec2 = 400 V dc at t = 0 hours, Ec1/Ib = 100 mA dc; t = 500 hours | --- | --- | --- | --- |
| Life-test end points: | --- | | | | | | |
| Stability | --- | 7/ | | ΔIb | --- | 20 | mA dc |
| Interelement leakage resistance (cold) | 1366 | --- | | Rg1g2<br>Rg1k<br>Rg2k<br>Rg2p | 50<br>50<br>50<br>50 | ---<br>---<br>---<br>--- | MegΩ<br>MegΩ<br>MegΩ<br>MegΩ |
| Power output | --- | --- | | Po | 235 | --- | W (useful) |
| Forced cooling | 1143 | 8/ 9/ | Ec1/Ib = 250 mA dc | T(anode core) | --- | 225 | °C |
| Coolant-pressure drop versus coolant flow (forced air) | 1155 | 8/ 10/ | No voltages applied | --- | --- | 0.35 | inch $H_2O$ |
| Humidity | 1011 | 8/ | | --- | --- | --- | --- |
| Humidity-test end point: | --- | | | | | | |
| Total grid current | 1266 | --- | | Ic1 | --- | -15 | μA dc |

See footnotes at top of next page.

TABLE I. Testing and inspection - Continued.

1/ At an anode dissipation of 250 watts and an incoming air temperature of 25°C maximum, a minimum airflow of 3.8 cubic feet per minute (cfm) at sea level shall pass through the anode cooler. At this flow of 3.8 cfm, the static pressure drop across tube and socket shown on Drawing 246-JAN shall be approximately 0.30 inch of water. The pressure drop varies with the amount of escaping air and with the shape and construction of the air director. This rating applies at bias voltages less than 100 volts and frequencies less than 500 MHz. Air cooling on the tube base shall be increased with increasing negative grid bias or with increasing frequency, or a combination of both. In all cases of operation, a socket which provides forced-air cooling of the base shall be used and maximum seal temperature ratings shall not be exceeded. The airflow shall be applied before or simultaneously with electrode voltages, and may be removed simultaneously with them.

2/ In all electrical tests involving heater voltage, the socket shown on Drawing 246-JAN, shall be used. Unless otherwise specified in the specific test conditions, forced-air cooling is permitted at the rate of 4.0 cfm maximum for the base and anode. A separate source may be used for the base anode, but neither shall exceed 4.0 cfm.

3/ The input wave shape shall have a tr and a tf of 25 μs maximum each, and the slope of the top of the pulse shall be not greater than 0.5 percent with a ripple not to exceed 0.1 percent.

4/ This test is to be the first test performed at the conclusion of the holding period.

5/ Alternately the power output test may be performed as follows:

| | | | | | |
|---|---|---|---|---|---|
| --- | Power output | Class AB1 amplifier;<br>F = 1 MHz (min), 30 MHz (max);<br>Eb = 1,600 V dc; Ec2 = 400 V dc;<br>Ec1/Ibo = 100 mA dc;<br>Rℓ = 2,000 ohms; t = 300 (max);<br>Pd/Po = 250 W (useful) | Ic1 | --- | 10 μA dc |

Drive power (Pd) may not be increased beyond the level which produces a grid current (Ic1) of 10 μA dc. For life-test end-point check of power output, Pd/Po = 235 W (useful).

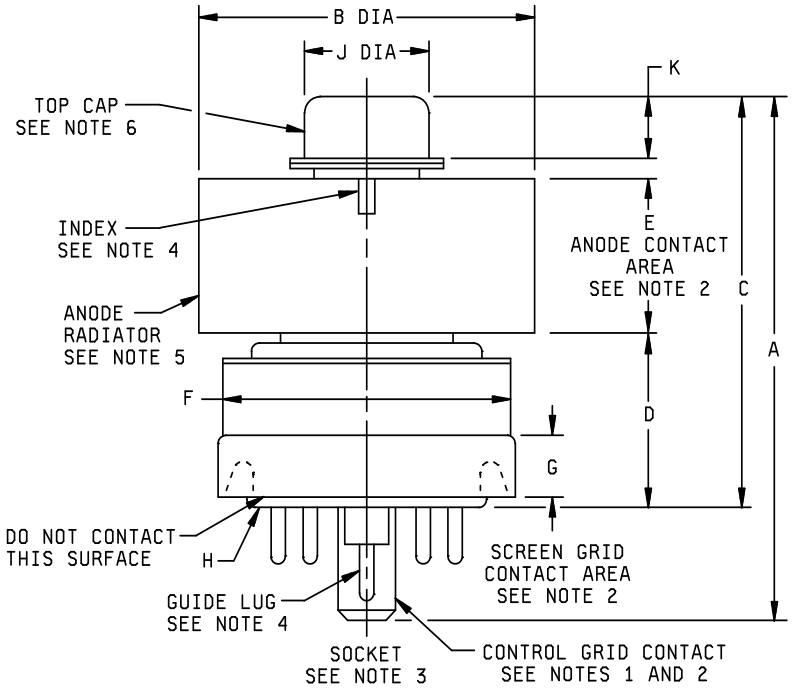
6/ Under the voltage conditions specified, the bias voltage shall be adjusted to produce the specified value of anode current during an initial adjustment period not to exceed 2 hours.

7/ With the voltage conditions as specified for life test, stability, including the original value of Ec1 which was used to set Ib = 100 mA dc, the value of Ib shall be measured and it shall not have changed by more than 20 mA dc from the original value of 100 mA dc.

8/ This test shall be performed yearly. In the event of failure, the test will be made as a part of conformance inspection, part 2. The yearly sampling plan may be reinstated after three consecutive samples have been accepted.

9/ The forced-cooling test shall be made as follows: At an ambient temperature of 25°C, both base and anode shall be cooled by applying an airflow of 3.8 cfm maximum at sea level from a single source using the infinite baffle system as shown on figure 2, or equal. At the test conditions specified herein, the anode core temperature shall not exceed the limits specified herein. Temperature shall be measured by means of a thermocouple located as follows: The thermocouple shall be embedded in the top of the core, adjacent to the cooler, by means of drilling a small hole, shallow enough so that the tube vacuum shall not be lost, placing the welded thermocouple junction therein, and then peening the edges of the hole to hold the thermocouple firmly in place. In all cases, good electrical continuity between the thermocouple and the metal area in close proximity shall be demonstrated before the cooling test can be performed.

10/ An infinite baffle system, as shown on figure 2, or equal, with an airflow of 3.8 cfm at sea level shall be used. The static pressure drop shall be measured across the tube and socket.

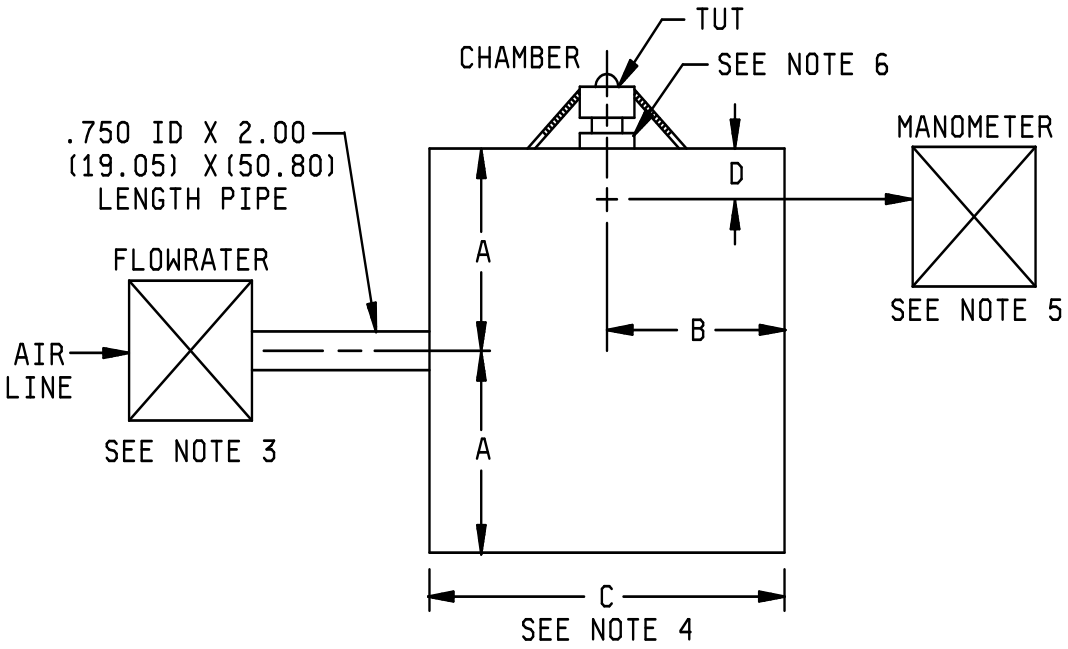



| PIN CONNECTIONS | |
|---|---|
| PIN NO. | ELEMENT |
| 1 | g2 |
| 2 | k |
| 3 | h |
| 4 | k |
| 5 | int con |
| 6 | k |
| 7 | h |
| 8 | k |
| CENTER POST | g1 |
| RADIATOR | a |
| BASE RING | g2 |

NOTES:
1. Pin alignment shall be checked by means of gauge GB8-3. Dimensions of control-grid contact shall be inspected by means of gauges specified on Drawing 246-JAN and shall be conformance inspection, part 2.
2. Alignment of anode, screen-grid, and control-grid contact surfaces shall be determined by means of gauge specified on Drawing 168-JAN. Conformance inspection, part 2, shall apply.
3. Air-system socket shall be as specified on Drawing 246-JAN, EIMAC SK-600, or equal.
4. Location of guide lug of control-grid contact shall be referenced by a notch or arrow on the anode radiator in position shown.
5. Anode clamping shall be confined to anode radiator.
6. Top cap outline optional provided it meets requirements of dimensions J and K.
7. Dimensions shall be checked yearly. In the event of failure, the test will be made as a part of conformance inspection, part 2. The yearly sampling plan shall be reinstated after three consecutive samples have been accepted.

| Ltr | Dimensions | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| Conformance inspection, part 2 | | | | |
| A | 2.324 | 2.464 | 59.03 | 62.59 |
| C | 1.810 | 1.910 | 45.97 | 48.51 |
| Conformance inspection, part 3 (see note 7) | | | | |
| B | 1.610 | 1.640 | 40.89 | 41.66 |
| D | .750 | .810 | 19.05 | 20.57 |
| E | .710 | .790 | 18.03 | 20.07 |
| F | --- | 1.406 | --- | 35.71 |
| G | .187 | --- | 4.75 | --- |
| H | Base: B8-236 (see note 1) | | | |
| J | .559 | .573 | 14.20 | 14.55 |
| K | .240 | --- | 6.10 | --- |

FIGURE 1. Outline drawing of electron tube type 8621.




| Ltr | Dimensions | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 5.995 | 6.005 | 152.27 | 152.53 |
| B | 5.995 | 6.005 | 152.27 | 152.53 |
| C | 11.995 | 12.005 | 304.67 | 304.93 |
| D | 1.995 | 2.005 | 50.67 | 50.93 |

NOTES:
1. Dimension are in inches.
2. Metric equivalents are given for general information only and are based upon 1.00 inch = 25.4 mm.
3. Fisher Porter flowrator model B4-27-10/77, or equal.
4. 12 inch (304.80 mm) cube inside dimensions, compound sealed.
5. F. W. Dwyer manometer, 0 to 1 inch (25.40 mm) of water (Fisher Scientific Company 11-295-5 draft gauge), or equal.
6. Socket specified on Drawing 246-JAN.

FIGURE 2. Baffle system.

Referenced documents. In addition to MIL-PRF-1, this specification sheet references MIL-STD-1311, Drawing 246-JAN and Drawing 168-JAN.

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