5727 PREMIUM TYPE

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GAS THYRATRON

7-PIN MINIATURE TETRODE TYPE

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:		
Voltage	6.3 ± 10%*	ac or dc volts
Current	0.6	amp
Cathode:		
Minimum heating time prior to tube conduction	20	sec
Direct Interelectrode Capacitances (Approx.):°		
Grid No.1 to anode	0.026	μμf
Grid No.1 to cathode, grid No.2, and heater	2.4	μμf
Anode to cathode, grid No.2, and heater	1.6	μμf
Ionization Time (Approx.):		
For dc anode volts = 100, grid-No.1 volts (square-wave pulse) = 50, peak anode amperes during conduction = 0.5	0.5	μsec
Deionization Time (Approx.):		
For dc anode volts = 125, dc anode amperes = 0.1, grid-No.1 resistor (ohms) = 1000, and grid-No.1 volts = -100	35	μsec
For dc anode volts = 125, dc anode amperes = 0.1, grid-No.1 resistor (ohms) = 1000, and grid-No.1 volts = -10	75	μsec
Maximum Critical Grid-No.1 Current:		
For anode-supply volts (rms) = 460, and average anode amperes = 0.1	0.5	μa
Anode Voltage Drop (Approx.)	8	volts
Grid-No.1 Control Ratio (Approx.) with grid-No.1 resistor (megohms) = 0, grid-No.2 volts = 0	250	
Grid-No.2 Control Ratio (Approx.) with grid-No.1 resistor (megohms) = 0, grid-No.2 resistor (megohms) = 0, grid-No.1 volts = 0	1000	

Mechanical:

Operating Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Dimensional Outline	*See General Section*
Bulb	T5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)

*,°: See next page.

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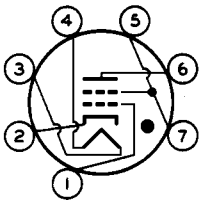
Basing Designation for BOTTOM VIEW 7BN

Pin 1 – Grid No.1
Pin 2 – Cathode
Pin 3 – Heater
Pin 4 – Heater



Pin 5 – Grid No.2
Pin 6 – Anode
Pin 7 – Grid No.2

RELAY AND GRID-CONTROLLED RECTIFIER SERVICE

Maximum and Minimum Ratings, *Absolute Values:*

For anode-supply frequency of 60 cps

PEAK ANODE VOLTAGE:		
Forward	650 max.	volts
Inverse	1300 max.	volts
GRID-No.2 (SHIELD-GRID) VOLTAGE:		
Peak, before tube conduction	-100 max.	volts
Average■, during tube conduction	-10 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Peak, before tube conduction	-100 max.	volts
Average■, during tube conduction	-10 max.	volts
CATHODE CURRENT:		
Peak	0.5 max.	amp
Average■	0.1 max.	amp
Fault, for duration of 0.1 second max.	10 max.	amp
GRID-No.2 CURRENT:		
Average■	+0.01 max.	amp
GRID-No.1 CURRENT:		
Average■	+0.01 max.	amp
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	25 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	150 max.	°C
AMBIENT TEMPERATURE	-75 min.	°C

Typical Operation for Relay Service:

RMS Anode Voltage	117	400	volts
Grid-No.2 Voltage	0	0	volts
RMS Grid-No.1 Bias Voltage□	5	-	volts
DC Grid-No.1 Bias Voltage	-	-6	volts
Peak Grid-No.1 Signal Voltage	5	6	volts
Grid-No.1-Circuit Resistance	1	1	megohm
Anode-Circuit Resistance#	1200	2000	ohms

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	10 max.	megohms

*,○,■,□,#: See next page.

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PULSE-MODULATOR SERVICE

For rectangular-wave shapes, duty cycle of 0.001 max., pulse duration of 5 μsec. max., and pulse-repetition rate of 500 pps max.

Maximum and Minimum Ratings, *Absolute Values:*

PEAK ANODE VOLTAGE:		
Forward	500 max.	volts
Inverse	100 max.	volts
GRID-No.2 (SHIELD-GRID) VOLTAGE:		
Peak, before tube conduction	-50 max.	volts
Average, during tube conduction	-10 max.	volts
GRID-No.1 (CONTROL-GRID) VOLTAGE:		
Peak, before tube conduction	-100 max.	volts
Average, during tube conduction	-10 max.	volts
CATHODE CURRENT:		
Peak	10 max.	amp
Average	0.01 max.	amp
Rate of change	100 max.	amp/μsec
PEAK GRID-No.2 CURRENT	0.02 max.	amp
PEAK GRID-No.1 CURRENT	0.02 max.	amp
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	0 max.	volts
Heater positive with respect to cathode	0 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	150 max.	°C
AMBIENT TEMPERATURE	-75 min.	°C

Maximum and Minimum Circuit Values:

Grid-No.1-Circuit Resistance	0.5 max.	megohm
Grid-No.2-Circuit Resistance	25000 max. 2000 min.	ohms ohms

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Values are initial, unless otherwise specified

	Note	*Min.*	*Max.*	
Heater Current	1	540	660	ma
Grid-No.1 Supply Voltage for Tube Conduction (1)	1,2	-2.9	-4.5	volts
Grid-No.1 Supply Voltage for Tube Conduction (2)	1,3	-	-5.2	volts
Grid-No.1 Supply Voltage for Tube Conduction (3)	4,3	-	-6.4	volts
Anode-Supply Voltage for Tube Conduction (1)	1,5	-	38	volts
Anode-Supply Voltage for Tube Conduction (1) at 500 hours	1,5	-	50	volts
Anode-Supply Voltage for Tube Conduction (2)	6,5	-	50	volts

*,○,■,□,#: See next page.

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	Note	Min.	Max.	
Anode-Supply Voltage for Tube Conduction (3)	7,8	650	–	volts
RMS Grid-No.2 Supply Voltage for Tube Conduction (This voltage is 180° out of phase with anode-supply voltage). .	1,9	1.9	3.3	volts
Heater-Cathode Leakage Current:				
Heater 25 volts positive with respect to cathode . .	1	–	15	μa
Heater 100 volts negative with respect to cathode . .	1	–	15	μa
Heater-Cathode Leakage Current at 500 hours:				
Heater 25 volts positive with respect to cathode . .	1	–	20	μa
Heater 100 volts negative with respect to cathode . .	1	–	20	μa
Leakage Resistance: Grid-No.2 to anode.	1,10	760	–	megohms
Leakage Resistance: Grid-No.2 to anode at 500 hours.	1,10	380	–	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With anode-supply volts (rms) = 460, grid-No.2 volts = 0, load resistor (ohms) = 3000, and grid-No.1 resistor (megohms) = 0.1.

Note 3: With anode-supply volts (rms) = 460, grid-No.2 volts = 0, load resistor (ohms) = 3000, and grid-No.1 resistor (megohms) = 10.

Note 4: With 7.0 volts ac or dc on heater.

Note 5: With grid-No.2 volts = 0, grid-No.1 volts = 0, load resistor (ohms) = 1000, and grid-No.1 resistor (megohms) = 0.1.

Note 6: With 5.7 volts ac or dc on heater.

Note 7: With 0 volts on heater.

Note 8: With grid-No.1 volts = −100, grid-No.2 volts = 0, and load resistor (ohms) = 10000.

Note 9: With anode-supply volts (rms) = 150, grid-No.1 supply volts (rms and in phase with anode-supply voltage) = 16.

Note 10: With grid-No.2 volts = ±380 with respect to anode and all other electrodes floating.

* For pulse-modulator service, tolerance is +10%, −5%.

° Without external shield.

■ Averaged over any interval of 30 seconds maximum.

□ Approximately 180° out of phase with the anode voltage.

Sufficient resistance, including the tube load, must be used under any conditions of operation to prevent exceeding the current ratings.

SPECIAL RATINGS AND PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . . 750 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are held rigid and are tested in

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four different positions. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for heater-cathode leakage current, grid-No.1 supply voltage for tube conduction (1) and anode-supply voltage for tube conduction (1).

Fatigue Rating:

Vibrational Acceleration. . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for heater-cathode leakage current, grid-No.1 supply voltage for tube conduction (1) and anode-supply voltage for tube conduction (1).

Heater-Cycling Life Performance:

Cycles of Intermittent Operation. . . . 2000 min. cycles

Under the following conditions: Heater volts = 7.5 cycled one minute on and one minute off, heater 100 volts negative with respect to cathode, and all other elements connected to ground.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test a tube is considered inoperative if it shows a permanent or temporary short or open circuit.

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that tubes have been properly stabilized. Conditions of life testing are specified under 500-hour intermittent life performance, except test run at room temperature. Tubes are initially read for grid-No.1 supply voltage for tube conduction (1). At the end of 1 hour, grid-No.1 supply voltage is read. The variation in the 0-hour and 1-hour readings will not exceed 15 per cent. Tubes must also meet established limits of grid-No.1 supply voltage.

100-Hour Survival Life Performance:

This test is performed on a sample lot of tubes from each production run to insure a low percentage of early inoperatives. Conditions of life testing are specified under 500-hour intermittent life performance, except test run at room temperature. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or

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temporary short or open circuit or fails to meet established limits of grid-No.1 supply voltage for tube conduction (1).

500-Hour Intermittent Life Performance:

This test is performed on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. Life testing is conducted under the following conditions: Heater volts = 6.3, anode-supply volts (rms) = 460, grid-No.2 supply volts = 0, average anode milliamperes = 80, peak anode milliamperes = 500, grid-No.1 resistor (ohms) = 50000, and minimum bulb temperature (°C) = 150. At the end of 500 hours, tube will not show permanent shorts or open circuits and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass established initial limits of heater current, grid-No.1 supply voltage (1), and 500-hour limits for anode-supply voltage (1), heater-cathode leakage current, and leakage resistance shown under CHARACTERISTICS RANGE VALUES.

OPERATING CONSIDERATIONS

Sufficient *anode-circuit resistance*, including the tube load, must be used under any conditions of operation to prevent exceeding the current ratings of the tube.

Curves shown under Type 2D21 also apply to the 5727

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