AMPEREX TUBE TYPE 6339

from JETEC release #1550, Dec. 12, 1955

The 6339 is a high vacuum, external anode clipper diode and rectifier tube which is only 2 inches long (without leads) and 3/4 inch in diameter. A miniaturized and ruggedized version of the 3B29, the 6339 operates under more stringent conditions than its prototype. It is designed to be enclosed in a complete liquid cooled package including power supply and pulse modulator components.

Operation in air at reduced ratings is allowed for applications where oil cooling is not necessary or required.

Although developed primarily for radar applications, it shows interesting possibilities for use in high voltage circuitry where space requirements are critical

GENERAL CHARACTERISTICS

ELECTRICAL DATA	MIN.	BOGEY	MAX.	
Filament Voltage	5.7	6.3	6.9	volts
Filament Current at Bogey Voltage	1.40	1.55	1.70	amps
Filament Warm-up Time	60	--	--	sec.
Peak Cathode current [1]	--	--	8.0	amps
Peak Inverse Voltage	--	--	16.0	KV
Plate-Cathode Capacity	--	2.2	--	uuf

MECHANICAL DATA

Mounting Position	any
Cooling	liquid immersion (silicone oil)[2]
Coolant Temperature Range	−65° to + 165° C
Shock Resistance	300 G impact
Vibration Resistance	10 − 60 cycles per sec. 0.080 inches total displacement.
Dimensions (without leads)	
Length	2 1/16 inches
Diameter	13/16 inches
Length of leads (approx.)	1 1/2 inches
Lead Connections - Heavy	Heater, cathode terminal
Thin	Heater terminal
Socket for anode end	Standard 60 amp. fuse clip or equal
Connection (filament leads)	Lugs as shown or banana plug optional
Weight (approx.)	1 1/2 oz.

[1] Represents maximum useable cathode current for any condition of operation.

[2] Dow Corning #510 fluid, viscosity 50 - 60 centistokes, or an equivalent. For air cooling see data following.

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MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

RECTIFIER (In Oil)

(Maximum ratings, absolute values)

Peak Inverse Voltage	10,000	16,000 volts
Peak Current	400	250 mA
Average Current	100	65 mA dc
Silicone Oil Coolant Temp.	−65° C to + 165° C	

Typical Operation (In Oil)

One Tube, Half-wave, Capacitor-Input Filter

Peak Inverse Voltage	10,000	16,000 volts
Peak Current	400	250 mA
Average Current - Load Current	100	65 mA
Load Voltage (approx.)	3300	5500 volts

Two Tubes, Single Phase, Full wave

Choke Input Filter

Peak Current (per tube)	200	130 mA
Average Current (per tube)	100	65 mA
Peak Inverse Voltage	10,000	16,000 volts
Load Current	200	130 mA
Load Voltage	2900	4900 volts

Three Phase Operation

Choke Input Filter

	Half Wave	Double Y	Bridge
No. of Tubes	3	6	6
Peak Inverse Voltage	10,000	10,000	16,000 volts
Peak Anode Current	300	300	195 mA
Average Anode Current (per tube)	100	100	65 mA dc
Output Voltage	4500	4500	14,000 volts dc
Ouptut Current	300	600	195 mA dc

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RECTIFIER - (In Air)

(Maximum ratings, absolute values - air cooled at sea level)

	Without Auxiliary Cooler	With Auxiliary Cooler	
Peak Inverse Voltage	12,000	12,000	volts
Peak Current	200	400	mA
Average Current	50	100	mA dc
Ambient Temperature	−55 to + 85	−55 to + 85	°C

Typical Operation In Air Without Auxiliary Cooler

	Single Phase Operation Choke Input Filter Full Wave	Three Phase Operation Choke Input Filter Half Wave	Three Phase Operation Choke Input Filter Bridge	
No. of Tubes	2	3	6	
Peak Inverse Voltage	12,000	10,000	12,000	volts
Peak Anode Current	100	150	100	mA
Average Anode Current (per tube)	50	50	33	mAdc
Output Voltage	3500	4500	10,500	volts dc
Output Current	100	150	100	mAdc

With Auxilary Cooler

No. of Tubes	2	3	6	
Peak Inverse Voltage	12,000	10,000	12,000	volts
Peak Anode Current	200	300	200	mA
Average Anode Current (per tube)	100	100	67	mAdc
Output Voltage	3500	4500	10,500	volts dc
Output Current	200	300	200	mAdc

SHUNT DIODE (In Oil)

(Maximum ratings, absolute values)

Peak Inverse Voltage	10,000 volts
Peak Current	8 amps
Average Current	18 mA
Pulse Duration in 100 microsecond interval	25 microseconds

Typical Operation (In Oil)

(One tube in hydrogen thyratron modulator circuit)

Pulse Time	1.0 microsecond
Network Impedance	50 ohms
Peak Thyratron Forward Voltage	10 KV
Repetition Rate	280 pulses per sec.
Diode Series Resistor	1000 ohms
Load Resistor[3]	0 ohms
Average Current Plate[3]	22 mA dc

[3] This load resistor represents a short circuit or arc in the load. As a result, the average diode plate current of 22 MA, D.C. will momentarily exceed the maximum rating of 18 MA, D.C. This circuit should be so designed that the high voltage will automatically shut off if continual short circuit exists in the load. The 6339 will operate, however, for longer than 500 hours under short circuit conditions which produce the average current as shown.

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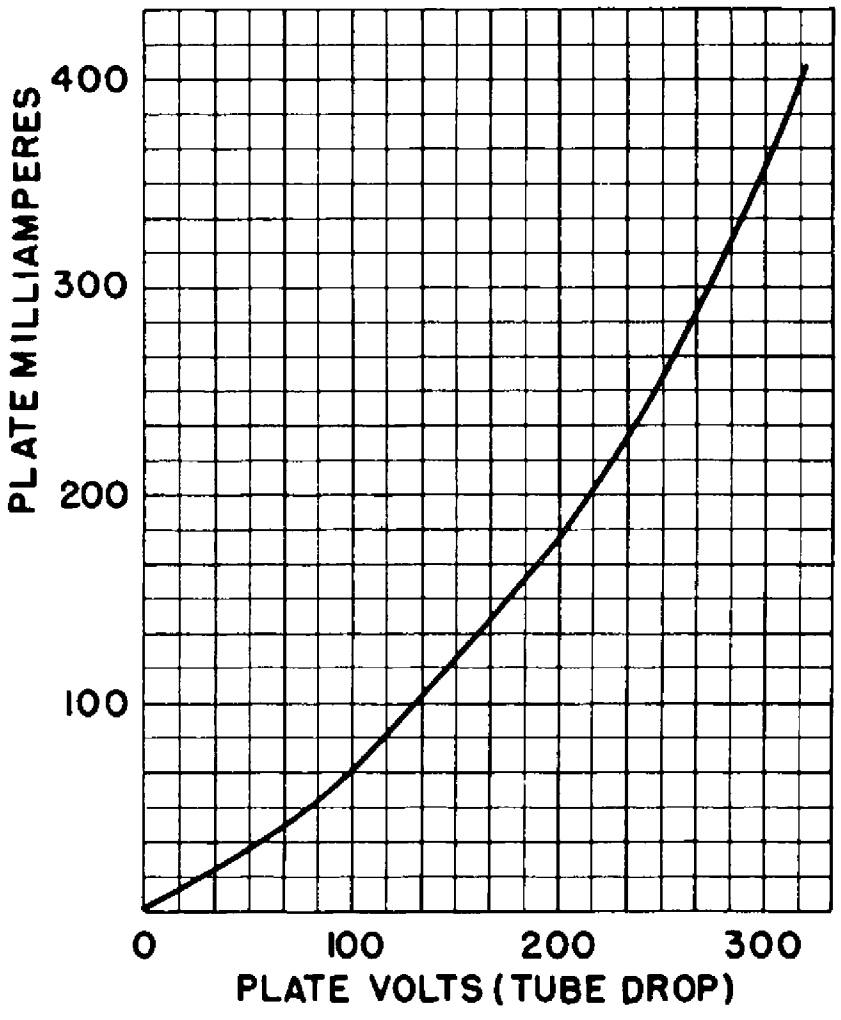
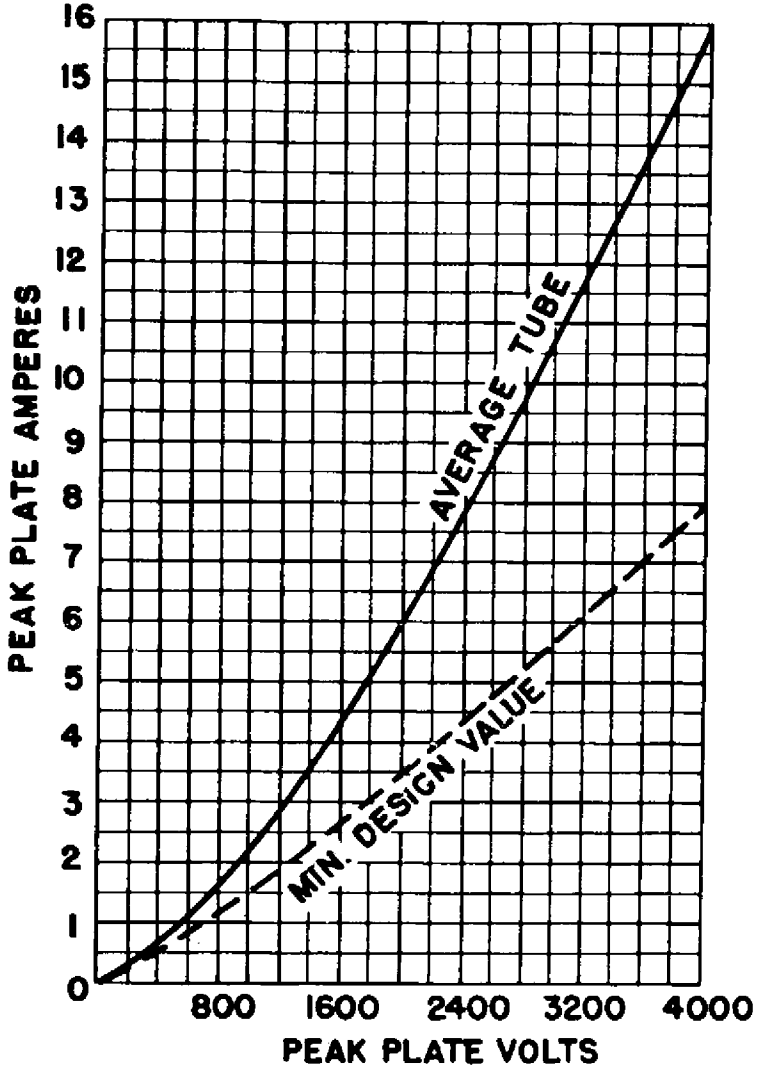
AMPEREX TUBE TYPE 6339
AVERAGE PLATE CURRENT VS.
PLATE VOLTAGE
(TUBE DROP CURVE FOR
RECTIFIER APPLICATION)



AMPEREX TUBE TYPE 6339
PEAK PLATE CURRENT VS. PEAK
PLATE VOLTAGE.
(TOTAL TUBE EMISSION CURVE
FOR SHUNT DIODE APPLICATION)



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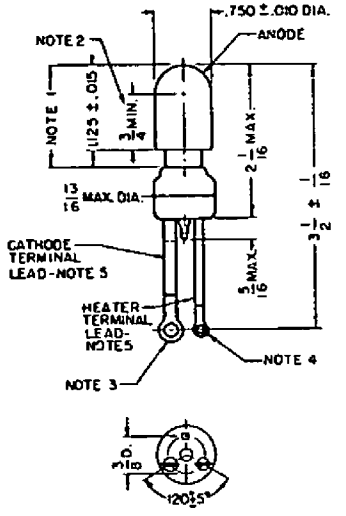
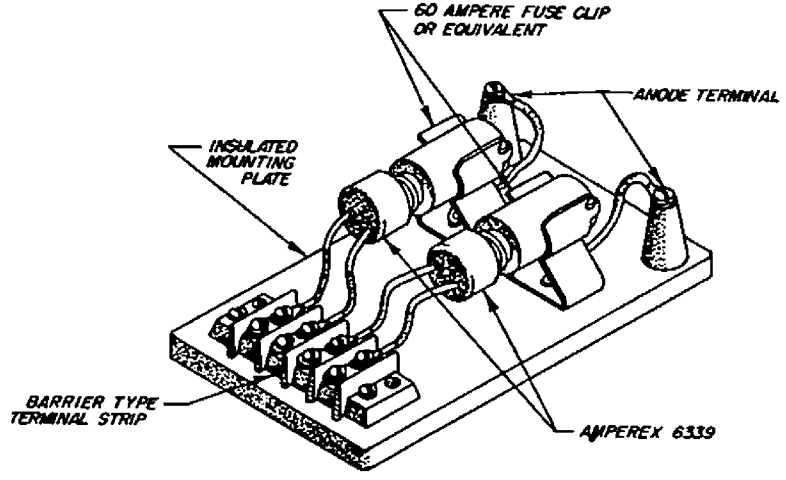


NOTES:
1. THIS SURFACE SILVER-PLATED.
2. SURFACE AVAILABLE FOR SUPPORT.
3. TINNED LUG FOR NO.8 SCREW-CRIMPED AND SOLDERED.
4. TINNED LUG FOR NO.6 SCREW-CRIMPED AND SOLDERED.
5. FLEXIBLE LEAD-INSULATED WITH FIBERGLASS.

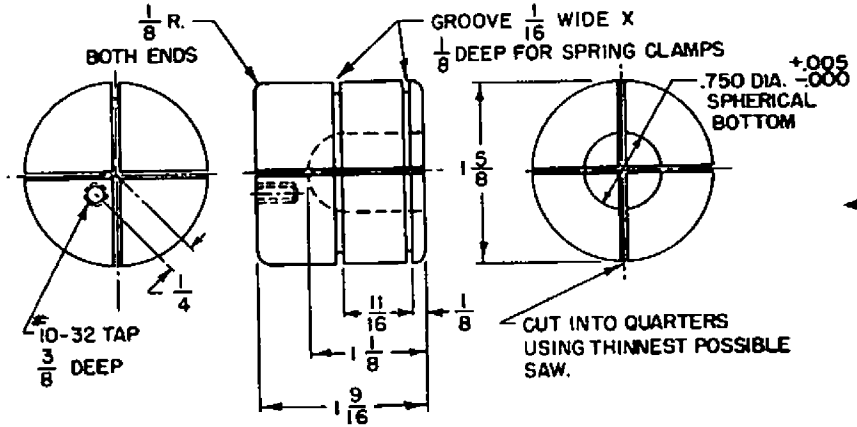


SUGGESTED MOUNTING FOR 6339 AIR COOLED OR LIQUID COOLED.

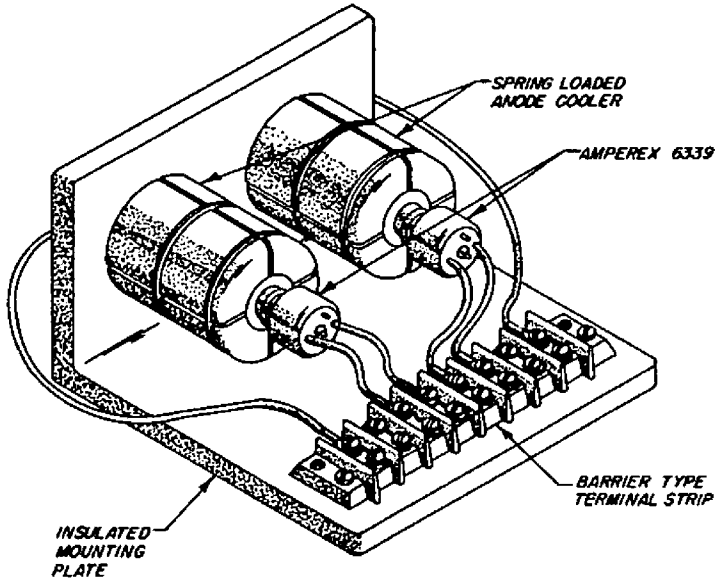
RECOMMENDED DESIGN

6339 ANODE HOLDER
(AUXILIARY COOLER)

MATERIAL: ALUMINUM



TWO SPRING CLAMPS OF HEAVY MUSIC WIRE REQUIRED.



SUGGESTED MOUNTING FOR 6339 WITH AUXILIARY COOLER