

MILITARY SPECIFICATION SHEET
ELECTRON TUBE, RECEIVING
TYPE 6203

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

The complete requirements for procuring the electron tube described herein shall consist of this document and the latest issue of Specification MIL-E-1.

DESCRIPTION: Rectifier, miniature, full wave, high vacuum

Outline - - - 6-3 (EIA)

Base - - - E9-1

Envelope - - - T6-1/2

Cathode - - - Coated unipotential

Base connections:

Pin No.	- - -	1	2	3	4	5	6	7	8	9
Element	- - -	2a	nc	nc	h	h	nc	k	nc	la

ABSOLUTE-MAXIMUM RATINGS:

Parameter:	E _f	E _{pp/a}	E _{hk}	R ₁	C ₁	I _o	i _{b/a}	i _{surge/a}	T _E	Alt
Unit:	V	Vac	V	Ohms	μF	mAdc	ma	a	°C	ft
Maximum:	6.9	Note 1	+100,-450	---	---	Note 1	300	2.0	180	Note 1
Minimum	5.7	---	---	---	---	---	---	---	---	---

TEST CONDITIONS: 6.3 400 --- 5,800 8 --- --- --- --- --- --- ---

GENERAL:

Qualification - Required

6203

FSC 5960

Method	Requirement or test	Notes	Conditions	AQL (percent defective)	Inspection level or code	Symbol	Limits		Unit	
							Min	Max		
<u>Quality conformance inspection, part 1</u>										
1231	Emission (1)	3	$E_b = 50 \text{ Vdc}$	0.4	II	I _s	165	---	mAdc	
1301	Heater current			0.4	II	I _f	830	970	mA	
1353	Operation of rectifiers	4,5	$E_{hk} = E_o$	0.4	II	I _o	70	---	mAdc	
1336	Heater-cathode leakage		$E_{hk} = -450 \text{ Vdc}$	0.4	II	I _{hk}	---	75	uAdc	
1201	Short and discontinuity detection			0.4	II	---	---	---	---	
<u>Quality conformance inspection, part 2</u>										
1211	Insulation of electrodes	3	$E(a-all) = -500 \text{ Vdc}$	2.5	S3	R	10	---	Meg	
1002	Barometric pressure, reduced		Pressure = 55 ± 5 mmHg; voltage = 980 Vac	6.5	See note 6	---	---	---	---	
1031	High-frequency vibration		No voltages	6.5	Code E	---	---	---	---	
1231	Emission (2)	3	$E_f = 5.5 \text{ V}; E_b = 50 \text{ Vdc}$	2.5	I	I _s	150	---	mAdc	
1121	Base strain			---	---	---	---	---	---	
2126	Envelope strain			2.5	I	---	---	---	---	
1041	Shock		450 G; Epp/a = 0	6.5	See note 6	---	---	---	---	
1031	Vibration-fatigue			6.5	See note 6	---	---	---	---	
Shock and vibration-fatigue test end points:										
1336	Heater-cathode leakage			---	---	I _{hk}	---	150	uAdc	
1353	Operation of rectifiers			---	---	I _o	65	---	mAdc	
1105	Permanence of marking			---	---	---	---	---	---	
Method	Requirement or test	Notes	Conditions				Symbol	Limits		Unit
<u>Quality conformance inspection, part 3</u>										
1506	Heater-cycling life		$E_f = 7.5 \text{ V}; E_{hk} = +100 \text{ Vdc}; E_{pp/a} = 0; 1 \text{ min "on"; } 4 \text{ min "off"}$			---	---	---	---	
---	Heater-cycling life-test end point:									
1336	Heater-cathode leakage		$E_{hk} = 450 \text{ Vdc}$			I _{hk}	---	150	uAdc	

Symbol	Requirement or test	Notes	Conditions	Symbol	Limits		
					Min	Max	Unit
	<u>Quality conformance inspection, part 3</u> - Continued						
1501	Intermittent life	4,7-9	TA = room; TE = +180°C (min); Enh = Ea	---	---	---	---
---	Intermittent life-test end points (500 hours):	10					
1353	Change in operation of rectifiers of individual tubes			alo	---	8.5	s
1301	Heater current			t	830	984	mA
1336	Heater-cathode leakage			If	---	75	uA
---	Intermittent life-test end points (1,000 hours):	10		Ihk			
1353	Change in operation of rectifiers of individual tubes			alo	---	11.5	s
1301	Heater current			t	830	993	mA
1336	Heater-cathode leakage			If	---	75	uA

NOTES:

- To simplify the application of the maximum rating to circuit design, absolute ratings are presented in chart form as rating charts I, II, III, and IV. Operating points should be so selected that the boundary limits on rating charts I, II, III, and IV are not exceeded under the worst probable operating conditions with respect to supply-voltage variation, equipment-component variation, equipment-control adjustment, and environmental conditions.

A brief description of each of the rating charts is given below. The values of ac supply voltage as presented refer to the unloaded supply voltages per anode.

- (a) Rating chart I. This chart presents the maximum ratings for ac anode supply voltage and dc output current. The boundary FABDG defines the limits for capacitor-input filter operation, and the boundary FABDG defines the limits for choke-input filter operation.
 - (b) Rating chart II. This chart provides a convenient method for checking conformance with the maximum steady-state peak-anode current rating. Rating chart II applies to capacitor-input filter operation only.
 - (c) Rating chart III. This chart shows the minimum value of anode supply resistance (R_s) required to remain within the transient peak-anode current rating. The value of R_s should be such that it lies to the left of the line on the rating chart at the highest probable value of line voltage. Rating chart III applies to capacitor-input filter operation only.
 - (d) Rating chart IV. This chart presents the maximum ratings for anode-supply voltage and altitude. Rating chart IV refers to both capacitor-input filter and choke-input filter operation.
- All values of Epp/a refer to the unloaded supply voltage. The ratings refer to rectifier operation with sinusoidal supply voltages within the frequency range of 25 to 1,000 Hz.
 - Test each section separately.
 - Adjust Zp/a in a full-wave circuit so that the TUT indicates 10 ± 75 mAdc. TUT has a tube drop of Etd = 22 vdc at 10 mAdc per anode.
 - This test shall be performed at the conclusion of the holding period.
 - This test shall be conducted on the initial lot and thereafter on a lot approximately every 12 months. When one lot has passed, the 12-month rule shall apply. In the event of the lot failure, the lot shall be rejected and the succeeding lots shall be subjected to this test until a lot passes. MIL-STD-105, sample size code letter E, shall apply.

NOTES: - Continued

7. In a full-wave life-test circuit the values specified for R1 and C1 may be considered as approximate and shall be adjusted initially to give not less than $I_o = 75 \text{ mAdc}$ and $i_b/\alpha = 270 \text{ ma}$ with a TUT.
8. Envelope temperature (TE) requirements, when measured in accordance with the temperature by conduction-band measurement (method 1226), will be satisfied if a TUT having bogey I_b (± 10 percent) under normal test conditions, is determined to operate at or above minimum specified temperature at any position in the life-test rack.
9. The life-test sample shall consist of 20 tubes per lot and not more than 1 tube failure shall be permitted. In the event of rejection of the first sample, due to failure of more than 1 tube, a second sample of 40 tubes shall be selected from the lot. Acceptance shall then be based on the combined first and second samples. The total tube failures from the combined first and second samples shall not exceed three.
10. The allowable defectives per characteristic shall not be greater than 1 for the first sample and shall not be greater than 3 for combined samples. Total defectives shall be 2 and 4, respectively, for 500 hours, and 3 and 6, respectively, for 1,000 hours.
11. Revision letters are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:

Army - ER
 Navy - EC
 Air Force - BS

Review activities:

Air Force - 99
 DLA - ES
 NAVY - MC

User activities:

Army - AR
 Navy - AS, CR
 Air Force - 11

Preparing activity:

Navy - EC

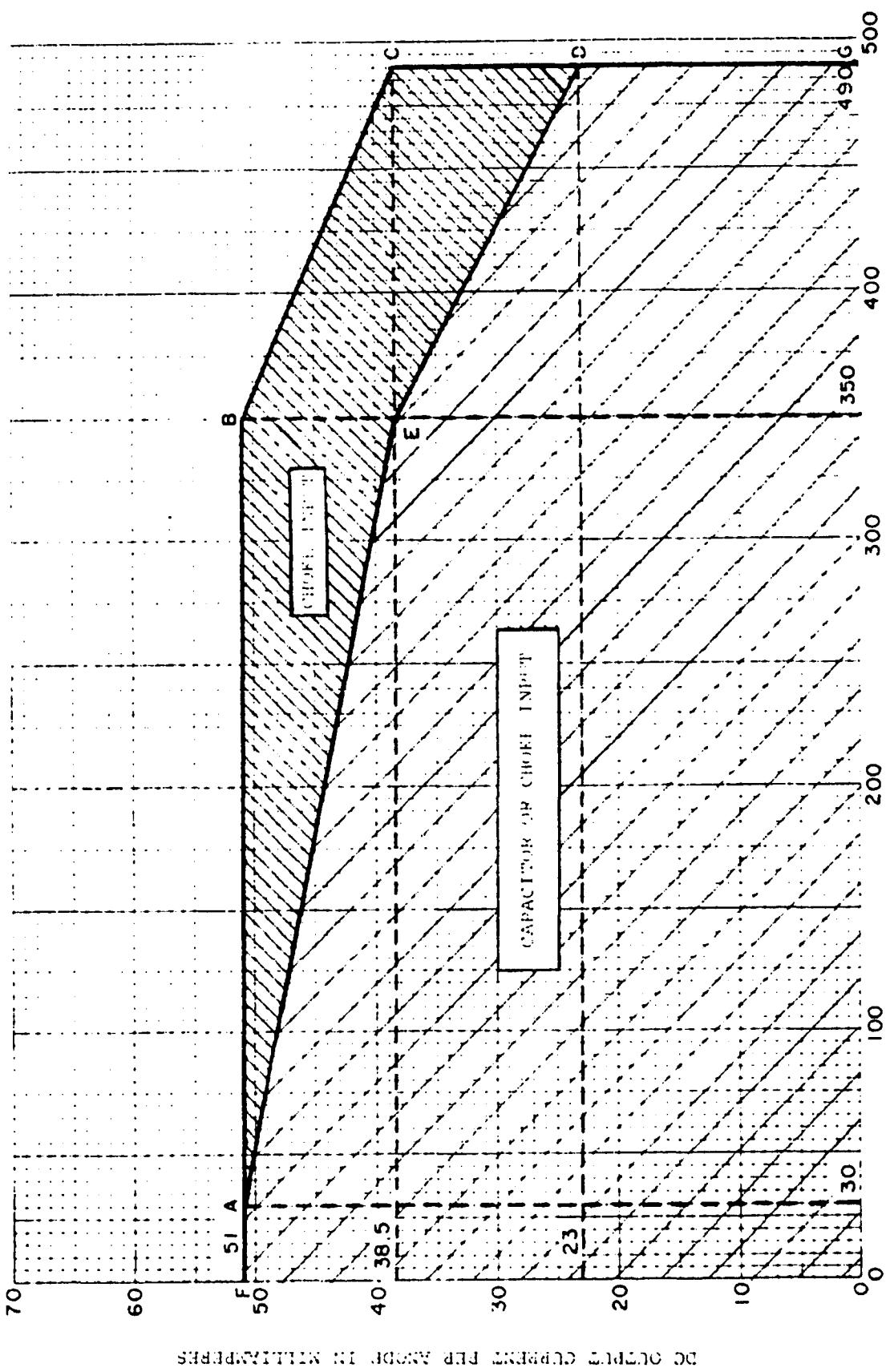
Agent:

DLA - ES

(Project 5960-3242)

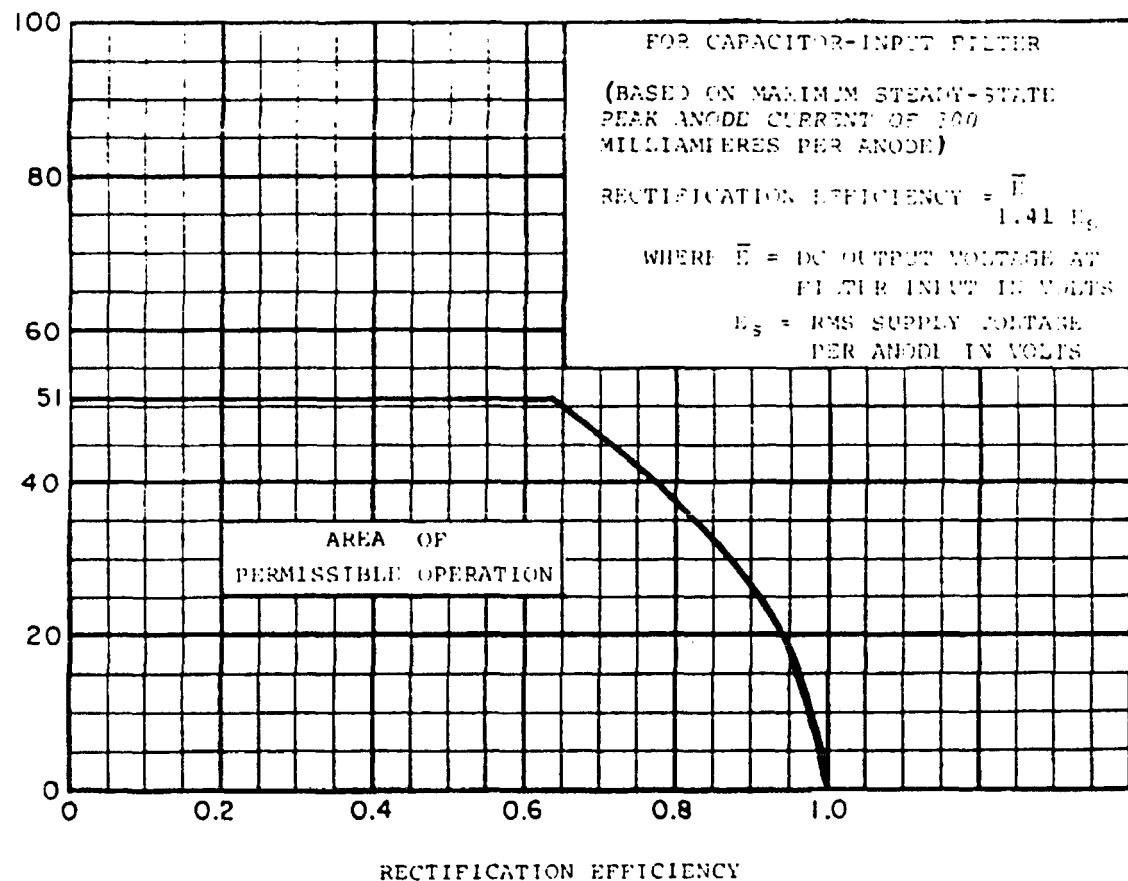
RATING CHART I

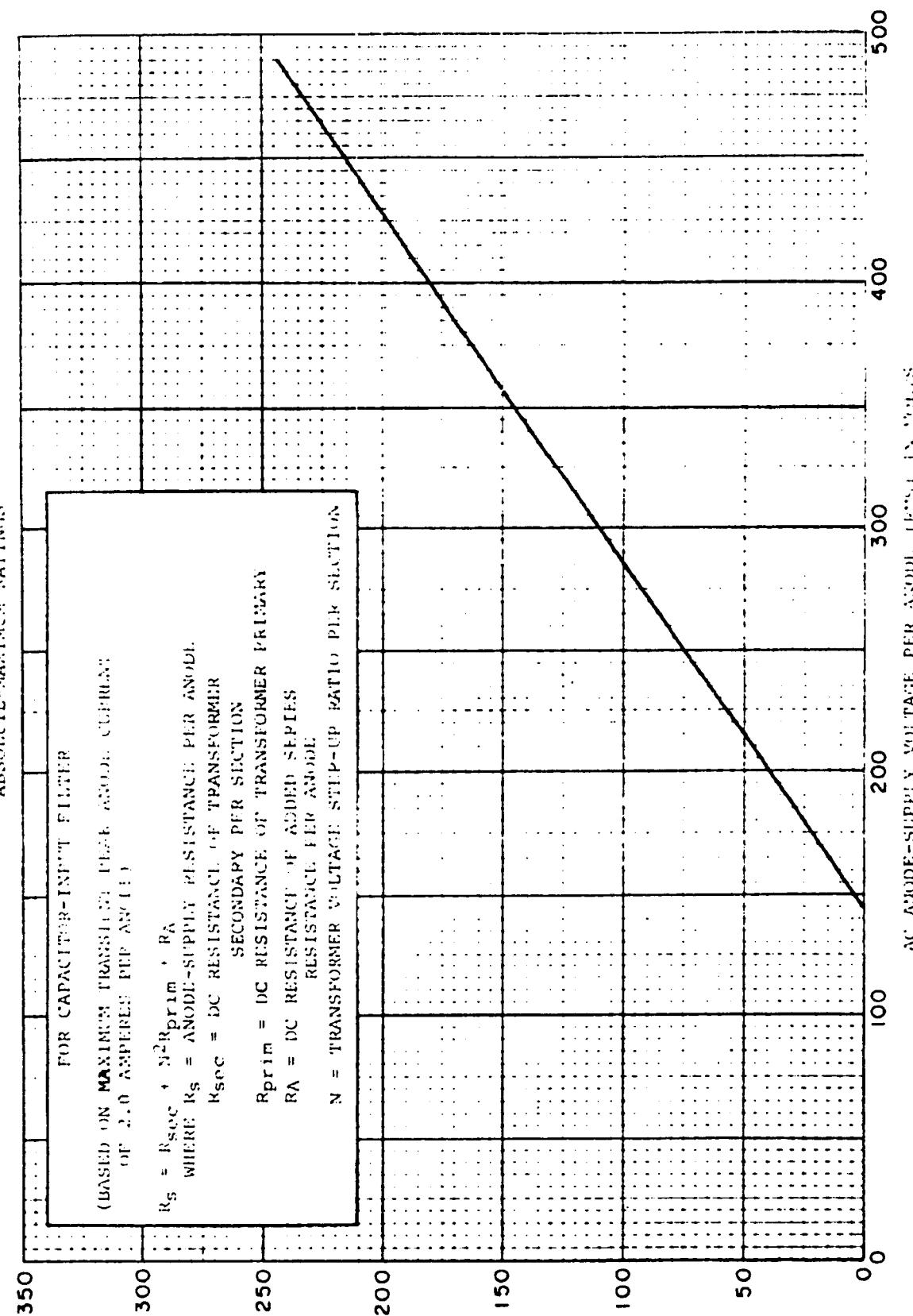
ABSOLUTE-MAXIMUM RATINGS



DC OUTPUT CURRENT PER ANODE IN MILLIAMPERES

RATING CHART II
ABSOLUTE-MAXIMUM RATINGS



MINIMUM ANODE-SUPPLY RESISTANCE PER ANODE (R_s) IN OHMS

RATING CHART IV

ABSOLUTE-MAXIMUM RATINGS

AMPERES IN AMP

