

ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION CV7405 - 7429

ISSUE NO.1 DATED 2.7.63
AMENDMENT NO.1

Page 2 Primary Electrical Characteristics CV 7413

Col.9 I_R at 100°C Amend 1.0 mA to read 0.1 mA.

Page 5 Sub-Group 3, Vibration Fatigue

Amend Inspection Level 1 to read 1A

Page 6 Sub-Group 8, Operation Life

Under Col. headed Specific Conditions add
t = 1000 hours.

Engineer in Chief G.P.O.

April, 1964.

ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION CV.7405-7429
ISSUE No. 1 DATED 2.7.1963
AMENDMENT No. 2

Page 2, Primary Electrical Characteristics.

CV.7406 Col. 9 IR at 100°C, amend 0.6 mA to read
1.25 mA

CV.7407 Col. 9 IR at 100°C, amend 0.3 mA to read
0.6 mA

July, 1964

Engineer-in-Chief G.P.O.

Against CV.7405-29 note
that CV.7405-19 are
Current category.

K1007/CV7405-7429
ISSUE 1
2nd July 1963

MILITARY SPECIFICATION

CV7405 — CV7429

SEMICONDUCTOR DEVICES, VOLTAGE-REGULATOR DIODES

Description This Specification covers the detail requirements for Silicon Voltage-Regulator Diodes, and is in accordance with K1007, except as otherwise stated.

Mechanical Dimensions and Outline

K1007 Section B. 10.3.3.1.

Connections Flange and Cathode.

Absolute Maximum Ratings

| Rating | P_{tot} | T_{op} | T_{stg} | Shock | Vibration |
|---------|-----------|----------|-----------|-------|-----------|
| Unit | W | °C | °C | g | g |
| Minimum | | -55 | -55 | | |
| Maximum | 1 | 150 | 150 | 1500 | 20 |
| Note | 1 | | | 2 | |

- Notes:- 1 See Derating Curve Fig. 1, Page 8
2 Duration 0.5 mS
3 Commercial Equivalent 1Z-T5 Series

(190357)

Primary Electrical Characteristics

CV 7405-CV7429

| CV No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------|---------------|---------------|---------------|----------------------------|---------------|---------------|---------------|---------------|------------------|--------------------------|
| | V_s Nom. | V_s Min. | V_s Max. | I_s (test current) | r_s Max. | S_s Min. | S_s typ. | S_s Max. | $I_R @$ 100°C | V_R test voltage |
| | volts | volts | volts | mA | ohms | %/°C | %/°C | %/°C | mA | volts |
| 7405 | 3.3 | 3.1 | 3.5 | 50 | 14.0 | -0.105 | -0.07 | -0.04 | 2.5 | 2 |
| 7406 | 3.6 | 3.4 | 3.8 | 50 | 13.0 | -0.095 | -0.06 | -0.025 | 0.6 | 2 |
| 7407 | 3.9 | 3.7 | 4.1 | 50 | 12.0 | -0.080 | -0.04 | -0.010 | 0.3 | 2 |
| 7408 | 4.3 | 4.0 | 4.5 | 50 | 11.0 | -0.065 | -0.02 | 0.005 | 0.2 | 2 |
| 7409 | 4.7 | 4.4 | 5.0 | 50 | 10.0 | -0.050 | 0.0 | 0.020 | 0.1 | 2 |
| 7410 | 5.1 | 4.8 | 5.4 | 50 | 9.0 | -0.035 | 0.01 | 0.035 | 0.05 | 2 |
| 7411 | 5.6 | 5.3 | 6.0 | 50 | 8.0 | -0.020 | 0.03 | 0.050 | 0.05 | 2 |
| 7412 | 6.2 | 5.8 | 6.6 | 50 | 7.0 | -0.005 | 0.04 | 0.065 | 0.01 | 2 |
| 7413 | 6.8 | 6.4 | 7.2 | 20 | 6.0 | 0.005 | 0.05 | 0.075 | 1.0 | 5.6 |
| 7414 | 7.5 | 7.1 | 7.9 | 20 | 4.5 | 0.015 | 0.055 | 0.085 | 0.1 | 6.2 |
| 7415 | 8.2 | 7.7 | 8.7 | 20 | 4.0 | 0.015 | 0.06 | 0.085 | 0.1 | 6.8 |
| 7416 | 9.1 | 8.6 | 9.6 | 20 | 4.0 | 0.020 | 0.065 | 0.090 | 0.1 | 7.5 |
| 7417 | 10.0 | 9.4 | 10.6 | 20 | 4.5 | 0.020 | 0.07 | 0.090 | 0.1 | 8.2 |
| 7418 | 11.0 | 10.4 | 11.6 | 20 | 5.5 | 0.025 | 0.07 | 0.095 | 0.1 | 9.1 |
| 7419 | 12.0 | 11.4 | 12.6 | 20 | 7.0 | 0.025 | 0.075 | 0.095 | 0.1 | 10.0 |
| 7420 | 13.0 | 12.4 | 14.1 | 20 | 10.0 | 0.030 | 0.075 | 0.100 | 0.1 | 11.0 |
| 7421 | 15.0 | 13.9 | 15.6 | 10 | 16.0 | 0.030 | 0.08 | 0.100 | 0.1 | 12.0 |
| 7422 | 16.0 | 15.4 | 17.1 | 10 | 20.0 | 0.035 | 0.08 | 0.105 | 0.1 | 13.0 |
| 7423 | 18.0 | 16.9 | 19.1 | 10 | 28.0 | 0.035 | 0.085 | 0.105 | 0.1 | 15 |
| 7424 | 20.0 | 18.9 | 21.2 | 10 | 37.0 | 0.040 | 0.085 | 0.110 | 0.1 | 16 |
| 7425 | 22.0 | 20.8 | 23.3 | 10 | 47.0 | 0.040 | 0.09 | 0.110 | 0.1 | 18 |
| 7426 | 24.0 | 22.7 | 25.9 | 10 | 55.0 | 0.045 | 0.09 | 0.115 | 0.1 | 20 |
| 7427 | 27.0 | 25.1 | 28.9 | 10 | 70.0 | 0.045 | 0.095 | 0.115 | 0.1 | 22 |
| 7428 | 30.0 | 28.6 | 31.8 | 10 | 85.0 | 0.050 | 0.095 | 0.120 | 0.1 | 24 |
| 7429 | 33.0 | 31.3 | 34.7 | 10 | 110.0 | 0.050 | 0.10 | 0.120 | 0.1 | 27 |

Requirements:

Marking K1007, Section B, 1.3.4. Minimum requirements
1.3.4.1. (a), (b) and (d).

Quality Assurance Provisions:

Destructive Tests The tests listed in Table II Group B Inspection, Sub-groups 2 and 3, and in Table III Group C Inspection, Sub-group 2 are considered destructive.

Group C Inspection Inspection shall be conducted on the initial lot and thereafter every 90 days or every fifth lot whichever occurs first.

Preparation for Delivery:

Packaging The devices shall be packed according to K1007, Section A 1.2 (c).

Joint Service Catalogue Numbers:

| | |
|----------------------------|----------------------------|
| CV 7405 = 5960-99-037-3441 | CV 7418 = 5960-99-037-3454 |
| CV 7406 = 5960-99-037-3442 | CV 7419 = 5960-99-037-3455 |
| CV 7407 = 5960-99-037-3443 | CV 7420 = 5960-99-037-3456 |
| CV 7408 = 5960-99-037-3444 | CV 7421 = 5960-99-037-3457 |
| CV 7409 = 5960-99-037-3445 | CV 7422 = 5960-99-037-3458 |
| CV 7410 = 5960-99-037-3446 | CV 7423 = 5960-99-037-3459 |
| CV 7411 = 5960-99-037-3447 | CV 7424 = 5960-99-037-3460 |
| CV 7412 = 5960-99-037-3448 | CV 7425 = 5960-99-037-3461 |
| CV 7413 = 5960-99-037-3449 | CV 7426 = 5960-99-037-3462 |
| CV 7414 = 5960-99-037-3450 | CV 7427 = 5960-99-037-3463 |
| CV 7415 = 5960-99-037-3451 | CV 7428 = 5960-99-037-3464 |
| CV 7416 = 5960-99-037-3452 | CV 7429 = 5960-99-037-3465 |
| CV 7417 = 5960-99-037-3453 | |

This Specification has been prepared ^{by} and the Qualification Approval Authority is:

The Engineer-in-Chief,
General Post Office,
S Branch,
LONDON.

TABLE 1 GROUP A INSPECTION

| Examination or Test | Test Conditions | | AQL % | Insp. Level | Symbol | Limits | | Units |
|---|-------------------|--|-------|-------------|--------|--------|-------|-------|
| | K1007/3 NATO Ref. | Specific Conditions | | | | Min. | Max | |
| <u>SUB-GROUP 1</u> Visual and Mechanical | 5.1 | Excluding Physical Dimensions | 0.65 | II | | | | |
| <u>SUB-GROUP 2</u> Breakdown Voltage | 8A2.4 | $T_{amb} = 25^{\circ}C.$ I_z as Col. 4. | 0.65 | II | V_z | Col.2 | Col.3 | Volts |
| Forward Voltage Drop | 8A3.2 | $T_{amb} = 25^{\circ}C.$ $I_F = 0.9A$ | | | V_F | - | 1.1 | Volts |
| Slope Resistance | 8A4.1 | $T_{amb} = 25^{\circ}C.$ I_s as Col. 4. | | | Z_z | - | Col.5 | Ohms |
| <u>SUB-GROUP 3</u> Reverse Leakage | 8A2.2.1 | $T_{amb} = 100^{\circ}C.$ | 2.5 | I | I_R | - | Col.9 | mA |
| <u>SUB-GROUP 4</u> Temperature Coefficient | 8A7.3 | $T_1 = 25^{\circ}C.$ I_z as Col. 4 $T_2 = 60^{\circ}C.$ | 4.0 | 1A | S_z | Col.6 | Col.8 | %/°C. |

TABLE 2 GROUP B INSPECTION

| Examination or Test | K1007/NATO Ref. | Test Conditions Specific Conditions | AQL % | Insp. Level | Symbol | Limits | | Units |
|---|--------------------|--|----------|----------------|--------|--------|-----|-------|
| | | | | | | Min | Max | |
| <u>SUB-GROUP 1</u> Physical Dimensions | 5.1 | According to Drawing 10.3.3.1 | 6.5 | 1C | | | | |
| <u>SUB-GROUP 2</u> Solderability Temperature Cycling Moisture Resistance | 5.13 5.5 5.3 | -55°C to +100°C | 4.0 | 1A | | | | |
| <u>SUB-GROUP 3</u> Vibration Fatigue | 5.15 | Non-Operating | 4.0 | I | | | | |
| <u>SUB-GROUP 4</u> Omitted | | | | | | | | |
| <u>SUB-GROUP 5</u> Omitted | | | | | | | | |
| <u>SUB-GROUP 6</u> Omitted | | | | | | | | |
| <u>SUB-GROUP 7</u> High Temperature Life (non-operating) | 6.2.1 6.6.1.2.2 | T _{amb} = 100°C t = 1000 hours | 4.0 | I | | | | |

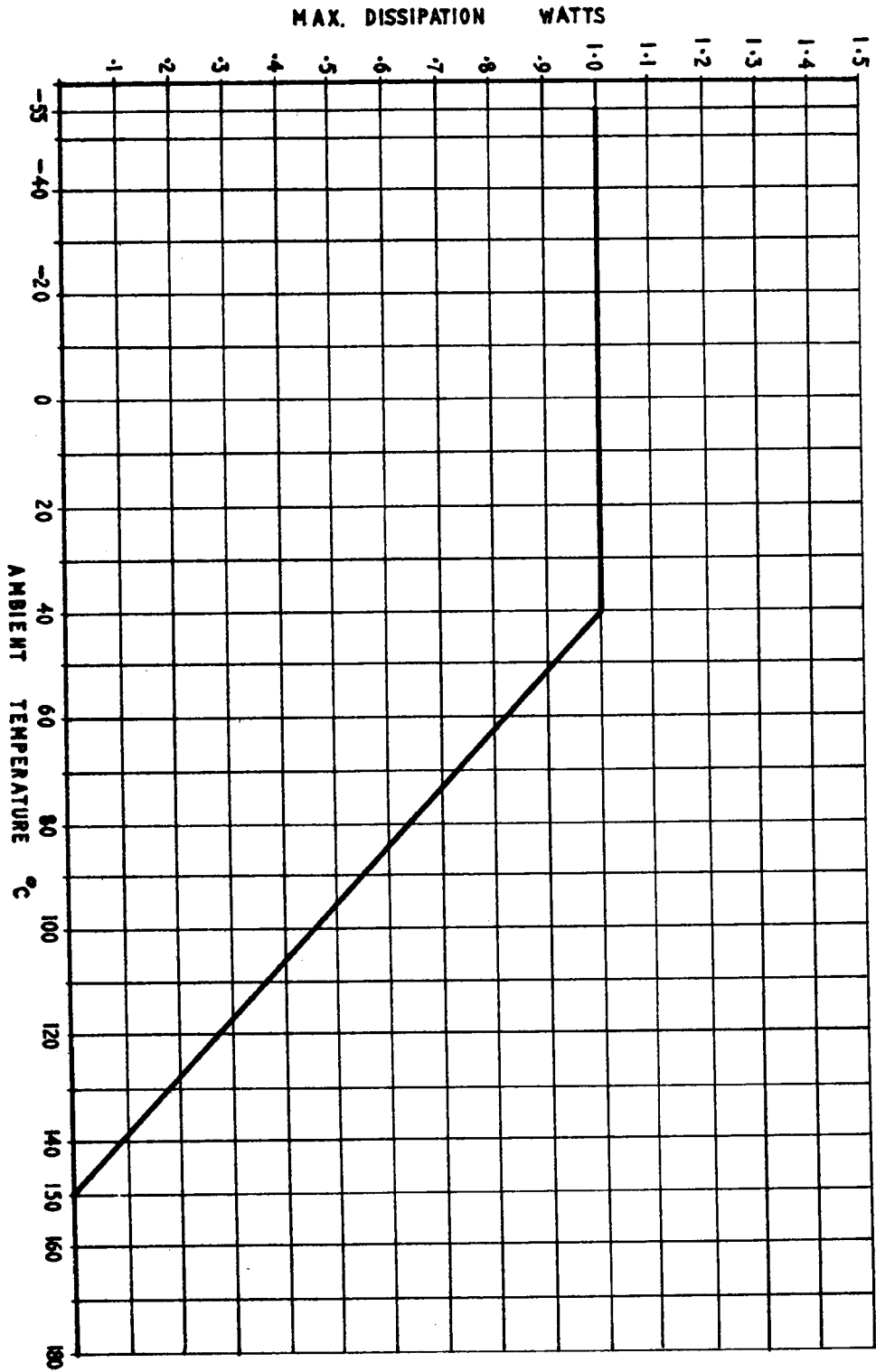
TABLE 2 GROUP B. INSPECTION Cont'd

| Examination or Test | Test Conditions | | AQL % | Insp. Level | Symbol | Limits | | Units |
|--|-----------------------------|---|----------|----------------|--------|--------|--------|-------|
| | K1007/NATO Refer | Specific Conditions | | | | Min. | Max. | |
| <u>SUB GROUP 8</u> | | | | | | | | |
| Operation Life | 6.3.4 | $T_{amb} = \text{not greater than } 140^{\circ}\text{C}$ $I_z \text{ to give dissipation not less than that according to the derating curve.}$ | 4.0 | IA | | | | |
| Post Test End Points for Sub-Groups 2, 3, 7 and 8. | 6.5 6.6.1.1 6.6.1.2.2 | | | | | | | |
| Breakdown Voltage | 8A 2.4 | As Group A. Sub-Group 2 | | | V_z | Col. 2 | Col. 3 | Volts |

TABLE 3 GROUP C INSPECTION

| Examination or Test | Test Conditions | | AQL % | Insp. level | Symbol | Limits | | Units |
|--|----------------------|---|----------|----------------|----------------|--------|-------|-------|
| | K1007/3 NATO Ref. | Specific Conditions | | | | Min | Max | |
| <u>SUB-GROUP 1</u> | | | | | | | | |
| Omitted | | | | | | | | |
| <u>SUB-GROUP 2</u> | | | | | | | | |
| Shock | 5.17 | Non-operating 5 blows in each of 3 mutually perpendicular directions. | 6.5 | 1A | | | | |
| <u>Post-Test End Point for Sub-Group 2</u> | | | | | V _Z | Col.2 | Col.3 | Volts |
| Breakdown Voltage | 8A2.4 | | | | | | | |

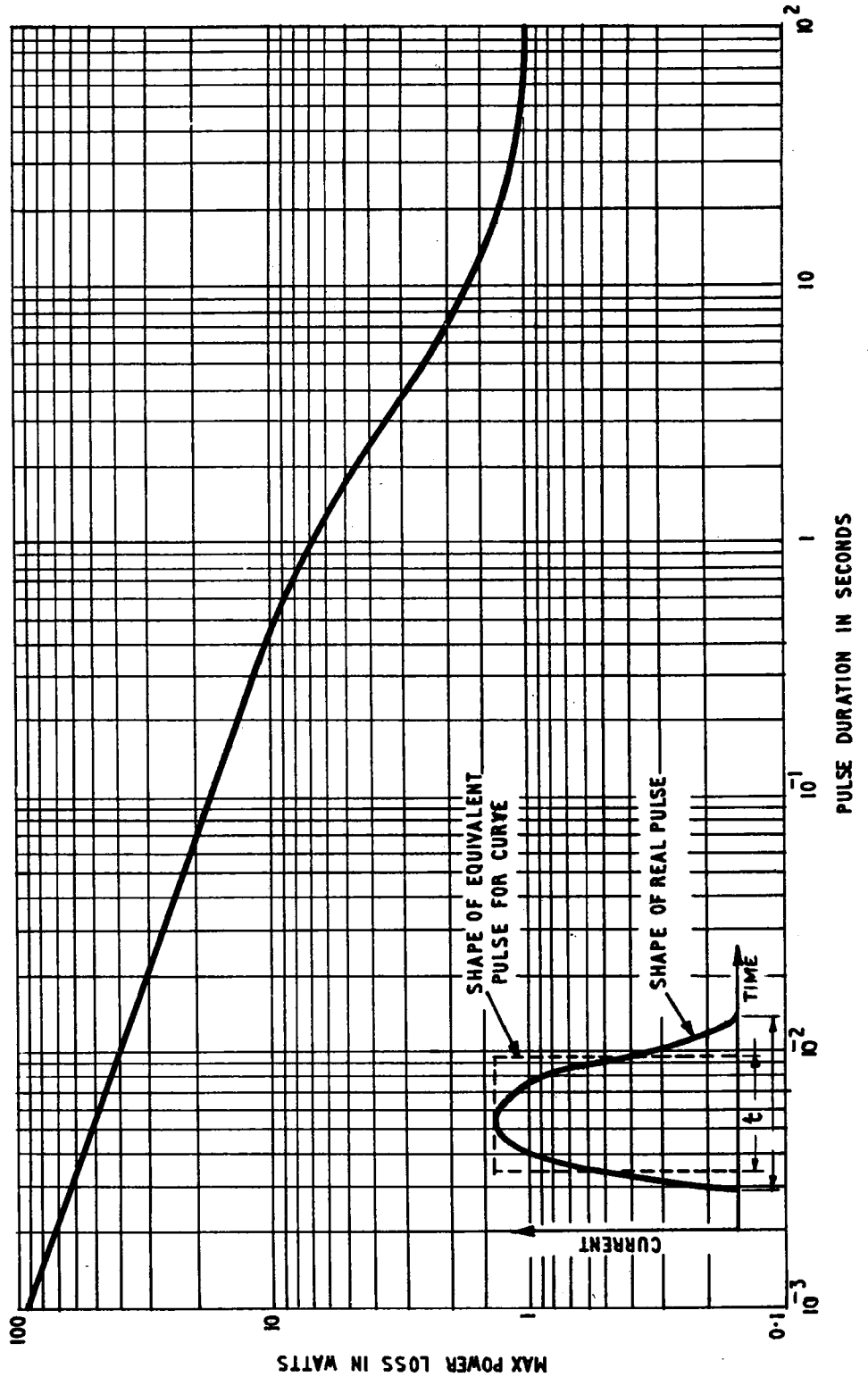
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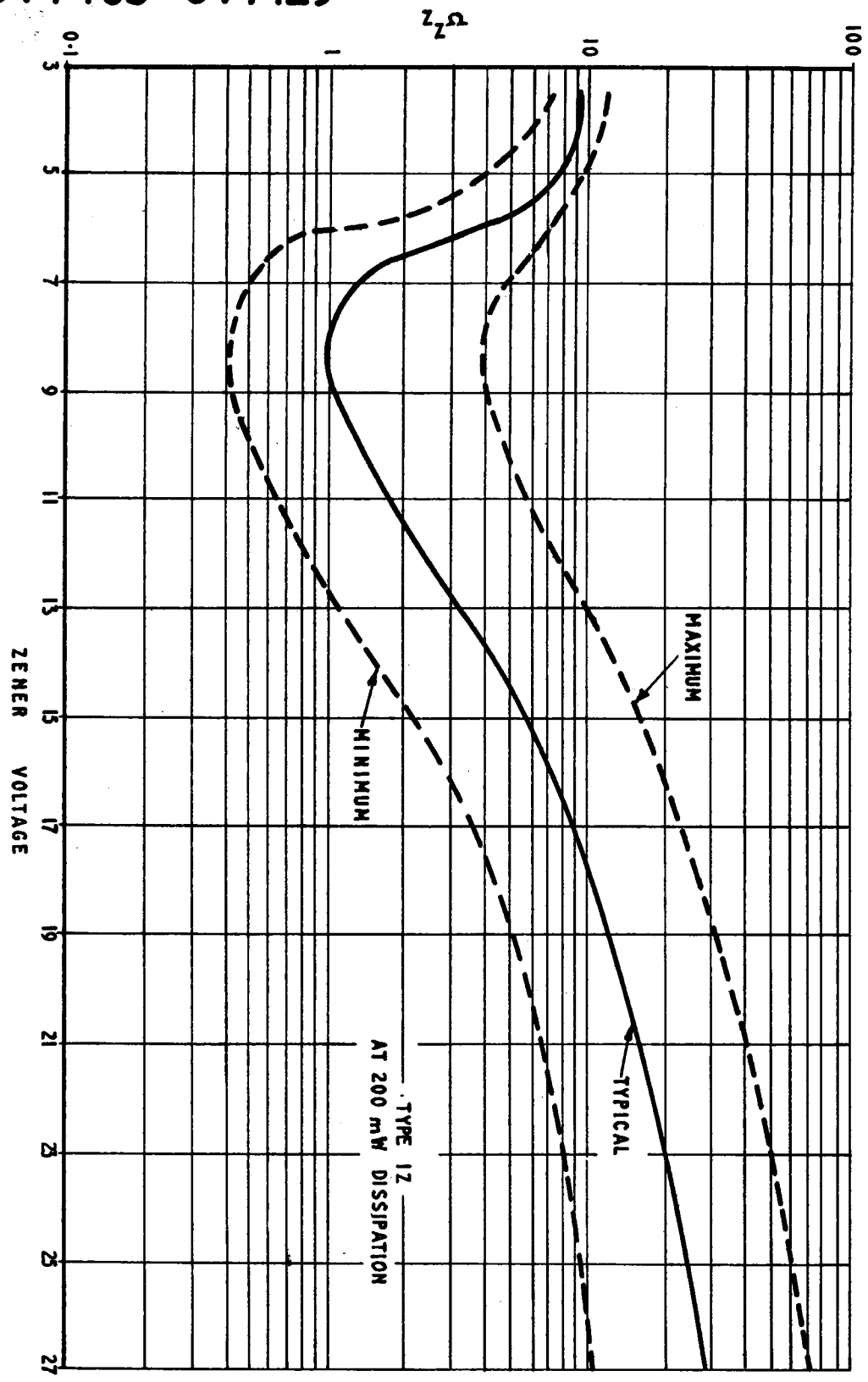
DERATING CURVE FIG. 1.

APPLICATION DATA I

PERMISSIBLE INTERMITTENT POWER LOSS AT 25°C AMBIENT TEMPERATURE
 FREE CONVECTION COOLING IN AIR, COOLING INTERVAL BETWEEN PULSES AT LEAST 2 MINUTES



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APPLICATION DATA 2
SLOPE RESISTANCE