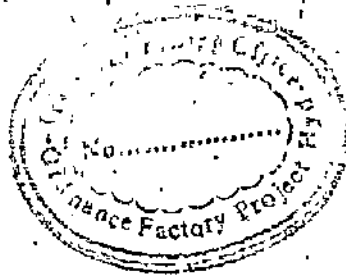


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REVISIONS

SHEET 1 OF 28

SUPERSEDES.



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" ALBUM NO - 268 "

" TECHNICAL DOCUMENTS FOR ILM 84/0848711-03-

" 75-40007 "

TECHNICAL SPECIFICATIONS

CH 3 . 362 . 010 TY

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ALBUM NO. 258

*Conventional index*

~~TECHNICAL DOCUMENTS FOR ITEM~~ 84/0848711 - 03 - 15 - 40007.

Sl. No.	Nos. of drgs assemblies articles	Description of technical papers	Nos. of drawings (process sheets).	Number of sheets in one copy	Remarks
1.	Extract from particular technical specifications.	Diodes A219A, A220, A220A, A220B,	010 TY	16	
2.	Appendix 1			1	
3.	Appendix 2			1	
4.	Supplimentary reference data for diodes, type A 219 A, A220, A220A A220B,			7	
Total number of sheets				25	

DIODES A, 219 A, A, 220, A, 220A, A, 220B.

EXTRACT FROM PARTICULAR TECHNICAL SPECIFICATIONS.

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Designation and purpose.

1.1. Present technical document is the extract from particular technical specifications, referring to the silicon-alloyed pulse diodes, types A<sub>219 A</sub>, A<sub>220</sub>, A<sub>220A</sub> A<sub>220B</sub>.

Present document sets up, the requirements for application of diodes A<sub>219 A</sub>, A<sub>220</sub>, A<sub>220A</sub>, and A<sub>220B</sub> and for rules used for incoming control of these diodes by development agency and manufacturer producing the equipment.

1.2. Diodes are made of normal and all-climatic designs.

2. Classification and Designation:

2.1. Diodes <sup>are</sup> ~~is~~ made of 4 types, <sup>A<sub>219A</sub>, A<sub>220</sub>, A<sub>220A</sub>, A<sub>220B</sub></sup> to be classified under normal conditions in compliance with Table 1.

3. Technical Requirements for Diodes.

3.1. Requirements for design.

3.1.1. General view, overall and mounting dimensions, layout and dimensions of leads should correspond to the outline drawing (Appendix 1).

3.1.2. Weight of the diodes should be not more than 0.53 gm.

3.1.3. Diodes should be hermetically sealed. The diode air tightness.

Factor as per the leakage of helium should not exceed  $5 \cdot 10^{-5} \mu \text{Hg/s}$

3.1.4. Leads of the diodes, including the points of their connection to the device, should withstand the following mechanical factors, without mechanical damage:

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- tensile force not exceeding 19.6 N,
- bending force.

Minimum distance between bending point and case should be 3 mm;

- twisting - by  $180^\circ$

3.1.5. Diode leads should be easily soldered and in so doing the proper diode should not be damaged minimum distance from the case to the soldered point of the lead should be 5 mm

External metallic parts of diodes should be corrosive-resistant.

3.1.7. Diodes should be light-tight.

3.1.8. Glass and glass - to-metal seal should be mechanically strong and heat-resistant.

3.1.9. Diode should be free from breaks and shorts in the circuits of electrodes (permanent and temporary).

3.2. Requirements for electrical parameters.

3.2.1. Electrical parameters and the characteristics of diodes should be kept within the limits of rates specified in the present document, both in operation and storage in conditions and for the time mentioned in the present document and after transportation in conditions, mentioned in the present document.

3.2.2. Electrical parameters of diodes are given in table 1.3. permissible limits of electrical conditions of operation are specified in table 2.

3.2.3. Electrical parameters should be stable within the limits of rates set up in the present document.

3.3. Requirements for reliability and guaranteed life (service life).

- e. Frost followed by de-frosting.
- d. atmospheric pressure from 605 to 29.7, 198 Pa.
- c. 98% at temp. + 35°C humidity relative air (with moisture condensation) upto
- b. temp. variation from - 60 to + 125°C
- a. ~~XXXXXXXXXXXXXXXXXXXX~~ ambient air temp. from - 60 to + 125°C

XXXXXX climatic effects:

- and serviceable operate in the conditions of the following
- 3.5.1. Diodes should be resistant to climatic effects
  - 3.5. Requirements for resistance to climatic effects.
    - e. Acoustic noises with in the frequency range from 50 to 10,000 Hz with maximum sound level of 140 dB.
    - d. Single impacts with acceleration upto 1000 g and impact duration of 0.2 to 1 ms.
    - c. Linear (centrifugal) loads with acceleration upto 500 g.
    - b. Frequent impacts with acceleration upto 150 g and impact duration of 1 to 3 ms.
    - a. 5000 Hz with acceleration upto 40 g!
  - 3.4.1. Diodes should be mechanically strong and serviceable in the conditions of mechanical <sup>loads</sup> applied to them: ~~loads~~
    - 3.4. Requirement for resistance to mechanical action.
      - 3.3.2. Storage life of diodes in heated storeroom with air conditioning as well as diodes fixed in protective equipment or in SITA set should be not less than 25 years.
      - than 60,000 hours.
      - 3.3.1. Guaranteed life (service life) in given modes and conditions specified in the present document should be not less

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1. Salt fog ( for all climatic design);
2. medium contaminated with mould fungi ( for all climatic design).

Notes: 1. Diodes which meet the requirements of item 3.5.1. e, and f, provided are delivered by special agreements.

2. Requirements for resistance to salt fog, and medium contaminated with mould fungi are provided in operation by coating the diodes with varnishes.

4. Rules for incoming control.

4.1. Incoming control (additional check of diodes to be delivered for compliance with the requirements of present document is performed by representative of development agency manufacturer producing the equipment to test serviceability of diodes in equipment.

4.2. Checking is carried out in compliance with the method in the conditions and as per the testing methods, specified in table.3 in items 1,2,3, .

4.3. It is allowed to carry out:

- test of diodes at higher ambient air temperature for not more than 2 hours;
- testing of diodes at lower ambient air temperature for not more than 2 hours.
- vibratory test for time not exceeding 5 minutes,
- electric ageing for time not exceeding 100 hours.

Conditions, mode and method of test are mentioned in table 3 (test Nos. 4,5,6,7,8).

Notes: Electric ageing of diodes is considered as part of guaranteed life period (service life) of diodes.

### 5. Methods of Testing.

5.1. Checking for compliance with requirements for design of diodes.

5.1.1. Checking of the overall and mounting dimensions and layout of leads is to be carried out by visual inspection, comparison with the drawing (appendix - 1) and by measurement of dimensions using measuring ~~tools~~ <sup>tools</sup> which provide accuracy specified in the drawing.

5.1.2. Checking of the appearance of diodes is to be carried out by visual inspection without using special devices. ~~which~~

While checking the appearance of diodes the following defects are allowed.

- in significant dents on the washers;
- insignificant sags and buns of solder not going beyond the over all dimensions, on tinned parts of diodes,
- traces caused by contact units, insignificant scratches as well as tool marks which do not ~~damage~~ <sup>damage</sup> anticorrosive protection of device,
- ~~convexity~~ <sup>curvature</sup> of leads without traces of sharp bendings and twistings;
- insignificant darkening of the tin-plated leads, separate dark spots on the tinned surface of the leads not ~~impairing~~ <sup>impairing</sup> wettability of leads and their anticorrosive properties;
- deviation of the form of the ~~defined~~ washer from the proper one, assymetry, uneven surface, small dents on the washers;
- surface dents of glass, surface irregularities and roughness of painting in kovCr-alloy bush-to-glass

to mechanical and climatic effects.

5.2.1. Break test is to be conducted in the following procedure: diodes are subjected to 3 to 5 impacts with acceleration  $150 \pm 30$  g in the direction perpendicular ~~dir~~ to diode axis, in so doing, absence of breaks is tested as per the method specified in appendix 2, drawing 1.

Diodes are considered to be fit for service if indicator unit does not indicate short-time breaks or if the form and dimensions of oscillogram (when measurement is taken by ~~ossillog~~ scope) do not have <sup>holes</sup> and spikes while 5 to 7 serial impulses are supplied with current amplitude  $300 \pm 50$  mA not having the dimensions and outbursts.

5.2.2. Resistance of the diodes to the vibration within the frequency range is to be checked in vibration stand which provides simple harmonic vibrations.

Test is carried out by smoothly changing frequency from 10 to 5000 Hz. with acceleration 40 g. for 5 minutes.

after the test the electrical parameters given in table - 3, are measured.

5.2.3. Cold resistance of the diodes is checked in cold chamber at temperature  $-60 \pm 3^{\circ}\text{C}$

After placing the diodes in cold chamber and setting temperature  $-60^{\circ}\text{C}$  if it they are kept in non-working condition for 20 minutes.

With the lapse of this time, with the diodes kept in the chamber, the electrical parameters, given in table 3 of present document for this test type are measured.

5.3. Checking for compliance with requirements for electrical parameters.

5.3.1. Electrical parameters, types, groups, procedure, standards, conditions and test methods should be in compliance with those given in table 3.

5.3.2. While switching on drift is checked by measuring the reverse current.

First reading time is 5 seconds.

~~First~~ Second reading time is 15 seconds.

If the parameter in the first and second readings is not the same, then the third reading is taken.

*Third reading time is 35 seconds.*

Diode is considered to be fit for service if the parameter rate of change for the 2nd interval of time is at least two times less than that for the first one and the maximum change during the entire test time does not exceed  $8 \mu A$  for diodes  $A 219 A$ ,  $A 220a$ ,  $6 \mu A$  for diodes  $A 220$  and  $10 \mu A$  for diodes  $A 220b$ .

Notes: 1. Repeated test drift may be conducted only after keeping the diodes in deenergized condition for two hours.

2. During the test of drift even the short-time drift of parameters beyond the standards is not allowed.

3. Change of parameters, including sign-variable one within the limits of one division off scale of the measuring device or  $\pm 1\%$  from the value to be measured is not considered when digital meters are used.

4. Uniform decrease of reverse current is allowed.

5. Drift of reverse current whose value is less than  $0.5 \mu A$  is not

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5.3.3. Total capacity of diode is measured as per GOST 18986 o 4, - 73, by the method of capacitive -ohmic divider. Measurement frequency is 1 to 10 MHz, amplitude of A.C voltage should not exceed 100 ~~cmV~~ V.

5.3.4. Diode reverse resistance recovery time is measured as per GOST 18986 o 8 - 73, diode group  $\Pi$ .

Total resistance of load is 600 ohms  $\pm$  20 %. Reading of reverse current reading level is 0.4  $\mu$  A.

5.3.5. Diode pulsewise forward voltage is measured as per GOST 18986.9 - 73, diodes group 5.

5.3.6. D.C forward voltage of diode and D.C reverse current of diode at higher temperature are measured after keeping the diode at the above mentioned temperature for not less than 10 minutes.

5.4. Checking for compliance with requirements for reliability.

5.4.1. Test (electric ageing) is conducted under half-wave rectification conditions. Time for keeping diodes in normal climatic conditions, in case of intermediate measurements and after the test should not be less than 2 hours.

6. Requirements for marking and methods for checking. Quality of marking.

6.1. Every diode should be provided with distinct non-erasable and indelible stamp designating the type of diode, month and year of manufacture. The polarity of the diodes should also be designated.

Note: For all climatic design letter "T" is to be included in the conventional designation, when order is made.

6.2. Quality of marking on the diodes is checked by visual inspection and by wiping the same with wet cotton cloth three times.

### Requirements for testing and measuring Equipment.

7.1. Testing devices and sets-up used for checking the parameters of diodes, should comply with the requirements specified in GOST 10863 - 70.

7.2. Testing equipment and measuring devices should provide fulfilment of requirements for the methods of testing and measurement of parameters.

7.3. Measuring devices should be checked in compliance with GOST 8.002 - 71.

7.4. While performing for climatic and mechanical tests, cable joints and separately made devices which are brought in circuits used for measuring electrical parameters of diodes (test Models), as elements of electric circuits should not cause change in the given measurement (test) conditions and affect the value of parameter to be measured.

When the given measurement (test) conditions are changed and the value of parameter to be measured is affected by errors caused by three-dimensional connecting device of the non-standard test stand, the error should be compensated and if it is not possible the error should be taken into account when the measurement (test) results are considered, in ascribing the value