

HIGH RELIABILITY PROCESSING OF RF TRANSISTORS

I WAFER PROCESSING

After wafers are processed, they are subjected to Motorola visual inspection specifications then probed to determine compliance with Group A specifications upon completion. Probe tests include the following: (1) Class Probe — performed to determine device type and yield; (2) Unit Probe each unit is subjected to Group A electrical tests — rejects are inked. Following the class and unit probe tests the wafer is scribed and broken.

II ASSEMBLY

The die are attached to headers and then wire bonded. The following mechanical tests are performed by Quality Control inspectors on a sample basis to ensure assembly process controls:

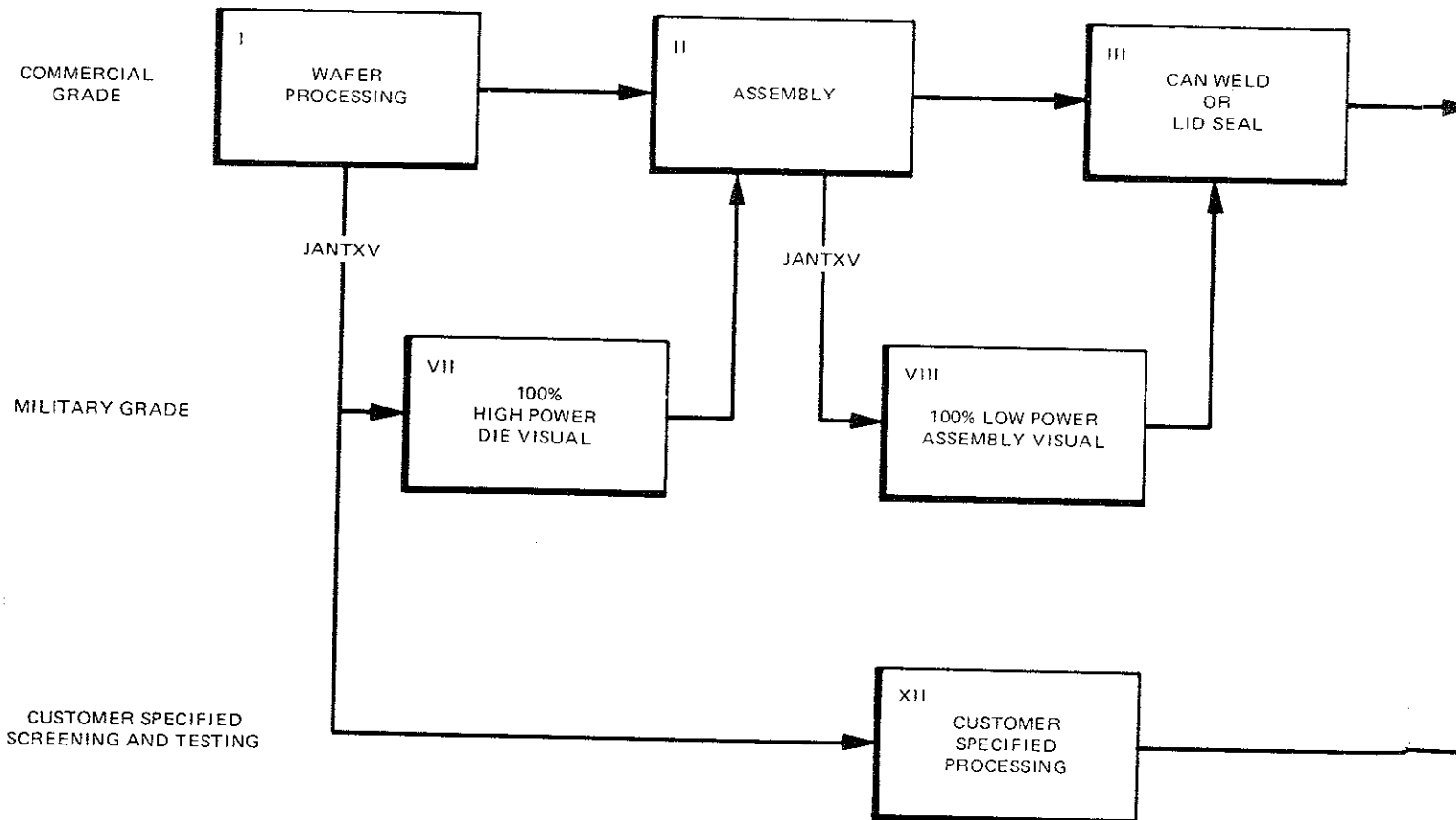
- (1) Wire pull tests
- (2) Die push off tests

Units are stored in dry air until ready for capping.

III CAN WELD OR LID SEAL

Completed headers are loaded into a vacuum chamber for can weld or processed thru a furnace for metal top attachments on ceramic packages with solder preforms. All devices are subjected to a high temperature storage (stabilization bake) prior to final Group A electrical selection.

PROCESSING AND QUALITY CONTROL FLOW CHART



VII 100% HIGH POWER DIE VISUAL

The high power portion of the inspection is performed to assure good die construction and front metal conditions. Individual reject criteria includes the following: Metalization defects such as scratches, voids, corrosion, adherence, bridging and alignment. Poor die construction conditions such as oxide and diffusion faults are also rejected.

VIII 100% LOW POWER ASSEMBLY VISUAL

The low power visual inspection controls workmanship, i.e. die attachment, internal lead-wire attachment, and package defects. Die attachment inspection includes assuring good adherence, die placement and proper orientation. Internal lead wires must have proper arc and all attachment bonds must be properly placed and in good condition. Package defect inspection includes checking for foreign material, improper construction and cracked glass conditions.

IV FINAL ELECTRICAL TEST

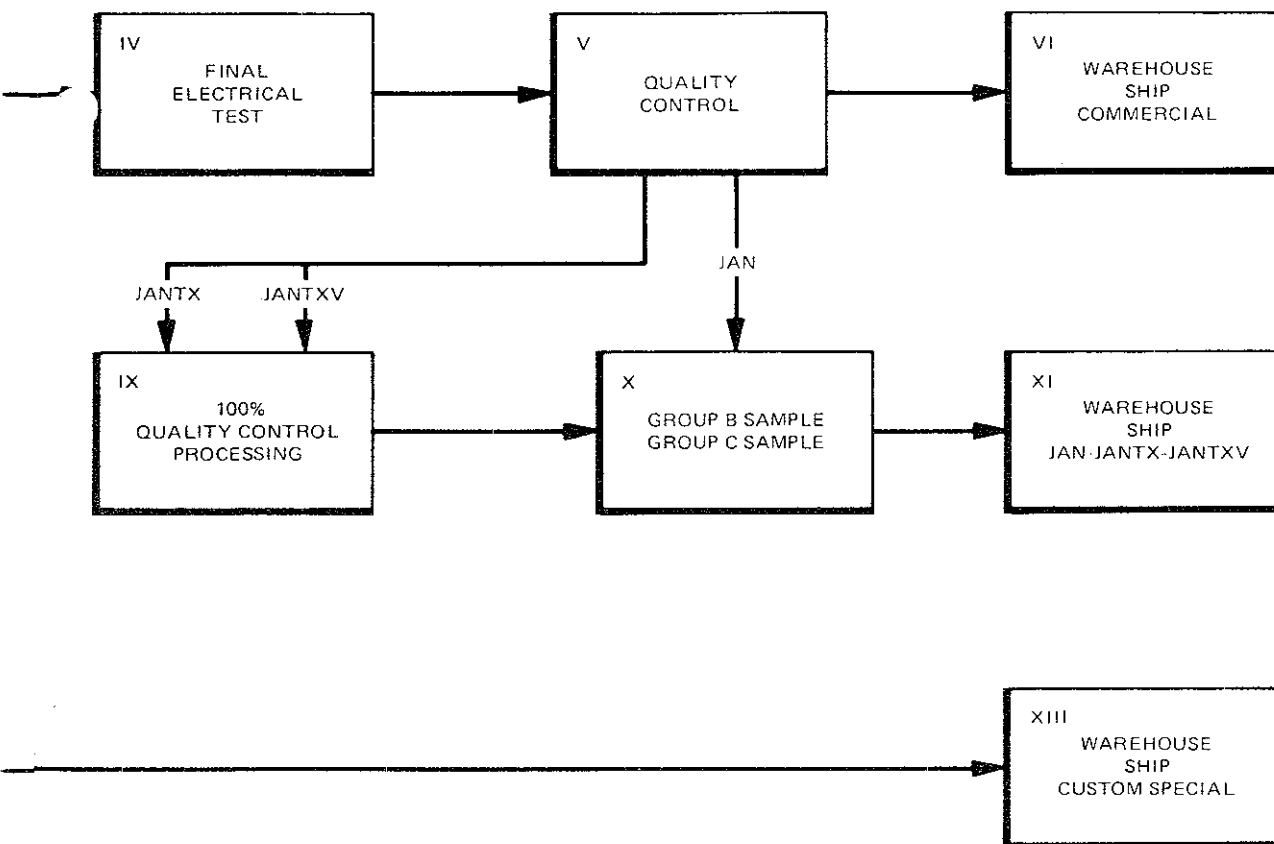
Completed units are selected for a Group A electrical test. Hand screening is performed where necessary. Electrical fallout units and over-runs are subject to future screening to

V QUALITY CONTROL

Samples are taken for complete electrical analysis of the lot. Group A and B tests are performed on JAN devices. Group A and B tests and 100% processing are performed on JANTX devices. Some devices also require Group C inspection tests.

VI WAREHOUSE

Upon completion, the finished product is ready for shipping. Purchase order requirements are carefully checked again prior to shipping. Over-runs are kept for future orders. Warranty tests (Group A) are performed annually on military devices.



IX 100% QUALITY CONTROL

- a High temperature storage
- b High temperature reverse bias
- c Temperature cycling
- d Thermal shock
- e Hermetic seal
- f Acceleration
- g Read & Record parameters
- h Room temperature burn-in

X GROUP B AND GROUP C INSPECTION

Typical Group B Processing (Sample Basis)

- a Physical dimensions
- b Moisture resistance
- c Terminal strength
- d Hermetic seal
- e Solderability
- f Vibration fatigue
- g 1000 hr. storage life
- h 1000 hr. operating life

Typical Group C Processing (Sample Basis)

- a ac parameters
- b Barometric pressure
- c Burn out pulsing
- d Resistance to solvents