DIODE AND THYRISTOR POWER MEASURES USING A MULTIMETER

APPLICATION NOTE

REFERENCES

Some diode and thyristor users don't have a tool to verify the semiconductor parameters, so in order to separate the components which are failed, it's common to use a multimeter (to measure the resistance). However, as it is explained below, this measures can be misleading.

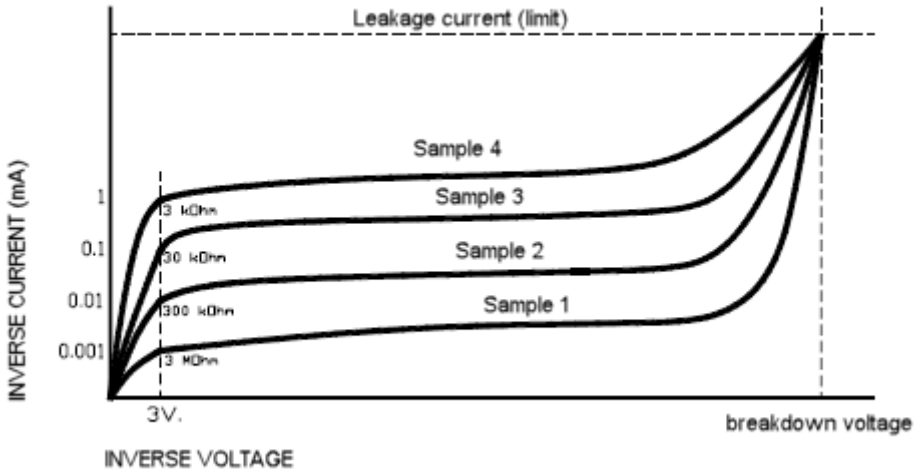
MEASUREMENT METHOD

Multimeter is normally used to measure the resistance between anode and cathode of the diodes and the resistance between gate and cathode in case of thyristors.
These measures are used to detect if the components are in open or short circuit.

The short circuit and open circuit tests are the only valid measures. If the resistance between the anode and cathode (diode) or gate and cathode (thyristor) is 0 means short circuit, and infinity resistance if it's an open circuit semiconductor.

The multimeter measure is not reliable for separate the components in good or bad condition, because of the multimeter internal battery is from 1.5V to 15V, and the leakage current at these voltages causes the obtained value.

The semiconductors have a non lineal leakage voltage/current curve, so the obtained value corresponds to a non lineal resistance curve (see the graphic below). The semiconductor blocking voltage is defined as the leakage current value produced by a voltage in a fixed temperature, as a result, the same type of components have a large variety of values in this range.



CAUTIONS

1.- Be sure that the component which you are testing doesn't have other components connected in parallel, in case of doubt, disconnect all the anode, cathode and gate (thyristor) connections.

2.- If the component to be measured is a press-pack package, be sure that there is enough compression force between it sides to achieve an uniform contact.

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CONCLUSION

Multimeter measures are not a reliable method to identify the working components versus the not working ones. However is a quick way to identify the broken down components (short circuit or open circuit).

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