

APPLICATION NOTE

Handling Precautions for Schottky Barrier Mixer and Detector Diodes

Damage by Burnout from Static Electricity

Source of Static Electricity	Precautions
Operator discharging charge on self through diode	Use metal or conductive plastic bench tops and chair seats. Ground operator with strap or use static eliminators, radioactive or ionized air type. Instruct operator in handling precautions.
Use of snow (expanded polystyrene) to hold diodes	Don't use.
Use of plastic bags	Only use dissipative bags or containers. Do not use non-dissipative plastic bags

Cold dry weather (resulting in low humidity) will increase the likelihood of static burnout.

Damage by Burnout on Test Kits

Source of Transient	Precautions
Bias circuit voltage transient	Have low voltage supply—not high voltage with dropping resistor. Do not use high value capacitance in voltage network. Bring bias voltage to zero before inserting diode.
Bias voltage wrong polarity	Use polarized plugs and supplies.
Transients in power supplies	Use regulated power supply shunting diodes.
Coupled voltage from other circuits	Use shielded leads to diodes. Avoid common wire harness for diode leads and high voltage circuits.
Charge in cables while connecting to circuit	Design checkout procedure and circuits to avoid this.
Ground loops	Have all connecting cables touch outside connections first.
High resistance scale ohmmeter	Maximum open circuit voltage should be 1.5 V. Use appropriate circuit or ohmmeter.

It is extremely important in all diode testing that the test equipment, test jig, and test fixtures be all connected and at the same electrical potential before the diode is inserted.

Damage by Burnout by Microwave Energy

Source of Microwave Power	Precautions
Pulse energy from same system	Use TR tubes in good condition. Use solid state limiters as well as TR tubes.
Pulse energy from other systems	Use shutter tubes when system not working.
High rectified voltage	Restrict dynamic range of signal or limit load resistor size.

Damage by Burnout During Electronic Assembly and Test

Source of Burnout Energy	Precautions
Leakage current from welding equipment and soldering irons	Ground equipment if possible. Test for leakage current and ground loops.
Pulse voltages from controllers and relays on ovens, environmental test equipment, etc.	Put capacitors across relays. Shield equipment. Shield diodes.
Pickup of RF energy from sources such as induction heaters, high power transmitters.	Shield and ground transmitters. Keep diodes in shielded containers. Keep diode and plumbing subassemblies shielded.
Accumulated charge on handling or assembly equipment	Use adequate grounding on all assembly and handlers

Damage by Mechanical Shock

Source of Shock	Precautions
Handling	Don't drop diodes or packages on bench or floor. Don't shake in packages.
Insertion in equipment	Diodes should not seat with a jerk or snap. Adjust mechanical tolerances for smooth insertion.
Cutting and forming leads	Support diode during operation. Have cutting and forming tools work smoothly.

Damage by Excessive Heat

Source of Heat	Precautions
Soldering	Use heat sink between diode body and point of soldering heat application. Keep exposure to heat at a minimum.

Detection of Damage

Test	Precautions
DC reverse test—3 V reverse	Low resistance indicates burnout of some type.
DC forward test	High resistance indicates mechanical or thermal damages.

General Precautions

Mark packages containing diodes with cautionary notices. (Upon request, Skyworks will supply diode packaging with such notation.)

Post instructions at locations where diodes are handled (such as incoming inspection, test stations, etc.).

Instruct inspectors and test operators as to precautions required.

It is extremely important in all microwave diode testing that the test equipment, test fixtures, diode holders, etc., all be connected together and at the same potential before the diode is inserted into the diode holder.

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