201.*net* SYSTEM TEST LIBRARY BY DEVICE
As of November 1, 2010

The SemiTek 201.net has the ability to perform more tests than any other system in it's class. This list provides a brief description of each as of this publication date. Some descriptions refer to the 201.net system's Input and Output Module. These modules stimulate the DUT. Depending on the test command, either the DUT input voltage, output voltage, or common current is measured. Others require add-ons or optional test heads.

In addition to these test Actions, there are General modules for creating operator prompts, adding comments or test times to a results log, and many other operator and operation commands including Categories.

Categories specify the acceptance criteria for the devices under test (DUTs). This module is usually used in conjunction with binning, which is dividing tested parts into groups according to electrical characteristics. There are two types of categories, Pass and Fail. A Pass category typically has the name of the part number and a list of the tests the part must pass to meet spec. A Fail category contains a list of tests on which any failure by the part indicates failure to meet spec.

ARRAYS

DIP18_HFEs applies an Emitter current and measures the Base current with a constant Collector voltage. The answer is the ratio of the Collector current (Ib + Ie) to the Base current. If this module is used with high gain devices, the Collector current and Emitter current will be almost equal.

DIP18_Icex measures the leakage current from Collector to Emitter with the Input open.

DIP18_Icexv measures the leakage current from Collector to Emitter with the Input set to a voltage.

DIP18_IinOn measures the input current to an 18-pin dual in-line package (DIP) of transistors.

DIP18_Vcesat measures the voltage drop from Collector to Emitter with Collector and Base current applied.

DIP18_VinOn applies Collector to Emitter voltage and adjusts the Input voltage until the Collector current reaches the required level.

Icex measures the leakage current from Collector to Emitter with the Input open.

Icexv measures the leakage current from Collector to Emitter with the Input set to a voltage.

IinOn measures the input current to a dual in-line package (DIP) of transistors.

VinOn applies Collector to Emitter voltage and adjusts the Input voltage until the Collector current reaches the required level.

BIPOLAR

BVcbo measures the breakdown voltage from Collector to Base with the Emitter open.

BVcboA measures the breakdown voltage from Collector to Base with the Emitter open. The Collector voltage is adjusted until the specified current is reached.

BVceo measures the breakdown voltage from Collector to Emitter with the Base open.

BVceoA measures the breakdown voltage from Collector to Emitter with the Base open. The Collector voltage is adjusted until the specified current is reached.

BVces measures the breakdown voltage from Collector to Emitter with the Base connected to the Emitter.

BVcesA measures the breakdown voltage from Collector to Emitter with the Base connected to the Emitter. The Collector voltage is adjusted until the specified current is reached.

BVebo measures the breakdown voltage from Emitter to Base with the Collector open.

HFE is the AC current gain of a transistor whether measured by test module HFEs, HfeA or hfe. Hfe adjusts a Collector current, Ic, and measures the Base current with a constant Collector-to-Emitter voltage, Vce. The answer is the ratio of the Collector current to the Base current. If this module is used with high gain devices, the Collector current and Emitter current will be almost equal.

HfeA applies a Collector to Emitter voltage and adjusts the Base current until the Collector current reaches the required level. The answer is the ratio of the Collector current to the Base current.

HFEs applies an Emitter current and measures the Base current with a constant Collector voltage. The answer is the ratio of the Collector current to the Base current. If this module is used with high gain devices, the Collector current and Emitter current will be almost equal.

Icbo measures the leakage current from Collector to Base with the Emitter open. The Output Module forces the voltage.

Icbs measures the leakage current from Collector to Base with the Emitter shorted to the Base. The Output Module forces the voltage.

Iceo measures the leakage current from the Collector to the Emitter with the Base open. The Output Module forces the voltage.

Icer measures the leakage current from Collector to Emitter with a Limit Resistor connected between Base and Emitter.

Ices measures the leakage current from the Collector to the Emitter with the Base shorted to the Emitter. The Output Module forces the voltage.

Icev measures the leakage current from Collector to Emitter with voltage applied between Base and Emitter.

Iebo measures the leakage current from Emitter to Base with the Collector open.

OffTimingTests runs the turn-off tests Toff, Ts, and Tf. No limits are checked by this module. Toff limits are checked with the sub module LimitToff. Ts limits are checked with the sub module LimitTs. Tf limits are checked with the sub module LimitTf. [Requires 0201166 Ton/Toff/Tr/Tf Test Head]

OnTimingTests runs the turn-on tests Ton, Td, and Tr. No limits are checked by this module. Ton limits are checked with the sub module LimitTon. Td limits are checked with the sub module LimitTd. Tr limits are checked with the sub module LimitTr. [Requires 0201166 Ton/Toff/Tr/Tf Test Head]

VbeOn measures the voltage drop from Base to Emitter with Collector and Base current applied.

Vbesat measures the voltage drop from Base to Emitter with current applied to Collector and Base.

Vcesat measures the voltage drop from Collector to Emitter with current applied to Collector and Base.

DIODE

BVRA measures the reverse breakdown voltage from Cathode to Anode by adjusting the voltage until the specified current is reached.

IR is current reverse (IR) on a diode, or the leakage current from Cathode to Anode. The voltage from cathode to anode is forced with the Output/Power Module.

Trr tests the reverse recovery time of a diode measured from two percentage points on the Anode ramp. DSO Channel-1 is at TP2. This test requires Option 45, the Timing Test Head.

VF measures the forward voltage drop from Anode to Cathode at a specific forcing current.

Vz measures the zener voltage, Cathode to Anode, by forcing a specific current from the Output Module and measuring the resulting voltage.

zzt measures the zener AC resistance of a diode by modulating DC at a specified frequency for a specified number of cycles, and dividing the change in voltage by the change incurrent for the resistance.

JFET

BVgss measures the breakdown voltage from Gate to Source with the Drain shorted to the Source.

gfs is the transconductance measurement of a JFET. This measurement should be higher on a JFET than on a MOSFET. Transconductance is the ratio the changes in current at the output port (delta **Id**) to the changes in voltage between the input ports (delta Vgs). Using the AC test method, the Drain current is adjusted through required levels while voltage between Gate and Source is measured. gfs is calculated as deltaId/deltaVgs.

IdOff measures the Drain current of a JFET when the device is turned off. Vds is forced with the Output Module, and Vgs is forced with the Input Module.

Idss is the Drain saturation current test, which measures the current from Drain to Source with the Gate shorted to the Source.

Igss measures the leakage current from Gate to Source with the Drain shorted to the Source.

RdsOn measures the resistance from Drain to Source with the Gate shorted to the Source.

Vgs adjusts the Gate voltage until the measured current is reached. The Drain is connected to the Gate.

VgsFwd measures the Gate to Source voltage with the Drain shorted to the Source.

VgsOff is the Gate to Source turn-off voltage test. The voltage from Gate to Source is adjusted until the Source current changes past a trip point.

JFET Normally OFF

BVdss measures the breakdown voltage from the Drain to the Source on Normally-Off JFETs. The Gate is shorted to the Source.

BVdssA adjusts the Drain to Source voltage until the measured current equals the specified current. The resulting voltage is the Drain to Source breakdown voltage. The Gate is shorted to the Source.

BVdsv measures the breakdown voltage from Drain to Source on Normally-Off JFETs. The Gate is back-biased to the Source.

BVdsvA adjusts the Drain to Source voltage until the measured current equals the specified current. The resulting voltage is the Drain to Source breakdown voltage. The Gate is back-biased to the Source.

Ciss measures the Gate capacitance on Normally_Off JFETs. Voltage from Drain to Source equals the Bias voltage. This module uses an LCR meter to calculate inductance (L), capacitance (C), and resistance (R). [Requires 0201368 Capacitance/Inductance Test Head]

Coss measures the Output capacitance on Normally_Off JFETs. Voltage from Drain to Source equals the Bias voltage. This module uses an LCR meter to calculate inductance (L), capacitance (C), and resistance (R). [Requires 0201368 Capacitance/Inductance Test Head]

Crss measures the Gate capacitance on Normally_Off JFETs. Voltage from Drain to Source equals the Bias voltage. This module uses an LCR meter to calculate inductance (L), capacitance (C), and resistance (R). [Requires 0201368 Capacitance/Inductance Test Head]

Idss measures the Drain current in Normally-Off JFETs. Voltage is applied Drain to Source, and the Gate is shorted to the Source.

Idsv measures the Drain current on Normally-Off JFETs. Voltage is applied to Drain and Gate.

IgsoFwd measures the forward Gate current on Normally-Off JFETs. Voltage is applied Gate to Source, and the Drain is left open.

Igss measures the Gate current on Normally-Off JFETs. Voltage is applied Gate to Source, and the Drain shorted to the Source.

IgssFwd measures the forward Gate current on Normally-Off JFETs. Voltage is applied Gate to Source, and the Drain is shorted to the Source.

Igsv measures the Gate current on Normally-Off JFETs. Voltage is applied Gate to Source, and the Drain is shorted to the Source.

RdsOn measures resistance from Drain to Source on Normally-Off JFETs. Current is applied to Drain, and voltage fromGate to Source.

Rg measures the AC Gate resistance with the Drain shorted to the Source on a Normally-Off JFET. This module uses an LCR meter to calculate inductance (L), capacitance (C), and resistance (R).

RgOn measures the slope (ratio of change) in voltage from Gate to Source (Vgs) versus current at the Gate (Ig) on a Normally-Off JFET. Using the AC test method, the Gate voltage is adjusted over required levels as changes in Gate current are measured. Then as shown more elegantly on the test window, RgOn is calculated as deltaVgs/deltaIg.

VgsTh measures the threshold voltage of a Normally-Off JFET bya djusting the Gate voltage until the measured current reaches a specified Drain current (Id) with voltage from Drain to Source (Vds) applied.

VgsTh_Eq measures the threshold voltage of a Normally-Off JFET at a specified Drain current (Id). The module keeps the Gate-to- Source voltage (Vgs) equal to Drain-to-Source voltage (Vds) by setting the Gate and Drain at ground and adjusting the negative Source voltage until the Drain current reaches Id.

VgsThS measures threshold voltage on a Normally-Off JFET by sweeping theG ate voltage From a start value until the measured Drain current reaches a specified Id, or thGea te voltage equals the To value, with voltage applied from Drain to Source,V ds.

MOSFET

BVdssA measures the breakdown voltage from Drain to Source with the Gate shorted to the Source. The voltage from Drain to Source is adjusted to achieve a specific Drain current (Id).This test is used in place of BVdss for low current (<100uA), high voltage applications.

GFS is the transconductance measurement of a MosfetE. This module uses the "DC" test method. GFS is calculated as (ID2-ID1)/DVgs. The test first searches for the Gate voltage (Vgs) at a given Drain current (ID1). Then the Gate is adjusted 1 or 10% and the Drain current (ID2) is measured again.

IdsOn measures the voltage drop from Drain to Source with Ids and Vgs applied. The Output Module in the 201.net Station forces the specified Ids, current from Drain to Source. The Input Module forces Vgs, voltage from Gate to Source.

Idss measures the leakage current from Drain to Source with the Gate shorted to the Source. The Output Module forces the specified voltage (VDS).

Igss measures the leakage current from Gate to Source with the Drain connected to the Source. The Output Module forces the specified voltage (VGS).

Igssr measures reverse leakage current, meaning from Drain to Gate with the Drain shorted to the Source. The Output Module forces the specified voltage (VGS).

IndLoad subjects the FET (field-effect transistor) to a current pulse from the Inductive Load Test Head. The test measures the peak voltage from Drain to Source.

OffTimingTests runs the turn-off tests Toff, Ts, and Tf. No limits are checked by this module. Toff limits are checked with the sub module LimitToff. Ts limits are checked with the sub module LimitTs. Tf limits are checked with the sub module LimitTf. [Requires 0201166 Ton/Toff/Tr/Tf Test Head]

OnTimingTests runs the turn-on tests Ton, Td, and Tr. No limits are checked by this module. Ton limits are checked with the sub module LimitTon. Td limits are checked with the sub module LimitTd. Tr limits are checked with the sub module LimitTr. [Requires 0201166 Ton/Toff/Tr/Tf Test Head]

RdsOn measures the resistance from Drain to Source with Id and Vgs applied. The Drain Current, Id is forced with the Output Module, and VGS, voltage from Gate to Source is forced with the Input Module.

Vds measures the voltage from Drain to Source with Id and Vgs applied. The Drain Current, Id is forced with the Output Module, and VGS, voltage from Gate to Source is forced with the Input Module.

VGSth measures the threshold voltage from Gate to Source at a specific current Id. The Drain is connected to the Gate. The Input Module forces the specified current, Id.

VGSthA measures the threshold voltage from Gate to Source at a specific current Id. The Drain is connected to the Gate. Voltage from Drain to Source, Vds, is adjusted to achieve the specified Drain current (Id).

Vsd measures the voltage drop through the body diode from Source to Drain. The Output Module forces the specified Source current, Is.

MOSFETDEPLETION

BVdsx measures the breakdown voltage from Drain to Source with the Gate voltage applied. The Output Module forces the specified Drain current (Id).

IdOff measures the leakage current from drain to source with the Gate voltage applied. The Output Module in the 201.net Station forces the specified VDS, voltage from Drain to Source, which is limited to 40V. The Input Module forces VGS, voltage from Gate to Source.

Idss measures the saturated current from Drain to Source with the Gate shorted to the Source. The Output Module forces the specified voltage (VDS).

Igss measures the leakage current from Gate to Source with the Drain connected to the Source.

Igssr measures reverse leakage current from Gate to Source with the Drain connected to the Source. The Output Module forces the specified voltage (VGS).

VGSth measures the voltage drop from Drain to Source with the Gate shorted to the Source and the Drain current (Id) and VGS, voltage from Gate to Source, applied.

RdsOn measures resistance from Drain to Source with the Gate shorted to the Source and a specified current (Id) applied from the Output Module.

Vsd measures voltage drop through the body diode from Source to Drain. The Output Module forces the specified Source current, Is.

OPTOCOUPLER [Requires 0201163 5x16 Test Terminal]

BVR applies a Cathode current and measures the reverse voltage drop from Cathode to Anode.

CTR applies an LED current and measures the Collector current. CTR means current transfer ratio. The answer is the ratio of the Collector current to the LED current.

CTR_Percent applies an LED current and measures the Collector current. CTR means current transfer ratio. The answer is the percentage of the ratio of the Collector current to the LED current.

DigitalMx specifies which pins of the 5x16 Matrix are connected to the Anode, Cathode, Vcc, Output, and Ground of the optocoupler.

IcbOff applies a Collector to Base voltage. The answer is the measured current.

IcbOn applies an LED current and measures the Collector current.

IceOff applies a Collector to Emitter voltage and measures the current.

IceOn applies an LED current and a Collector to Emitter voltage. The answer is the measured Collector current.

InputIon adjusts the LED current until the solid state relay (SSR) turns on.

InputVoff adjusts the LED voltage until the solid state relay (SSR) turns off.

Ioff applies a voltage between Output1 and Output2 and sets the LED voltage to the maximum off voltage. The answer is the output current.

IR applies a Cathode to Anode voltage and measures the current.

LedMx tests only the LED. You can set which pins of the 5x16 Matrix connect to the anode and cathode of the LED.

MosFetMx specifies which pins of the 5x16 Matrix connect to the Anode, Cathode, Source and Drain of the transistor.

NpnMx tests only the transistor. You can select which pins of the 5x16 Matrix connect to the Base, Emitter, and Collector of the transistor.

NpnNoBaseMx specifies which pins of the 5x16 Matrix connect to the Anode, Cathode, Emitter, and Collector of the transistor.

NpnNoEmitterMx specifies which pins of the 5x16 Matrix connect to the Anode, Cathode, Base, and Collector of the transistor.

Ron turns on the SSR and applies an output current. The answer is the measured voltage drop from Output1 to Output2 divided by output current.

SSR_Mx tests the solid state relay (SSR). You can set which pins of the 5x16 Matrix connect to the Anode, Cathode, Output1, and Output2.

Vcesat applies an LED current and a Collector current. The answer is the measured voltage drop from Collector to Emitter.

VF applies an Anode current and measures the forward voltage drop from Anode to Cathode.

RELAYS [Requires 0201163 5x16 Test Terminal]
Coil_I applies a voltage to the coil and measures the coil current

Coil_R applies a voltage to the coil and measures the coil current and calculates the coil resistance

ContactR_NC applies a current to the contact, measures the contact voltage, and calculates the contact resistance

ContactR_NO applies a voltage to the coil, a current to the contact, measures the contact voltage, and calulates the contact resistance

ContactV_NC applies a voltage to the coil, a current to the contact, and measures the contact voltage

ContactV_NO applies a voltage to the coil, a current to the contact, and measures the contact voltage

TonToff measures the operate or release time

SIDAC [Requires 0201357 Sidac Test Head]

OnTests sets the current pulse amplitude and the If Current, the level for measuring Vf. The dV/dT can be selected as one of four values. This module measures three values: holding current (Ih), forward voltage (Vf), and peak voltage (Vpeak). No limits are checked by this module. Sub module LimitIh checks Ih limits. Sub module LimitVf checks Vf limits. Sub module LimitVpeak checks Vpeak limits.

Vbo forces current and measures the breakover voltage that turns on a sidac. The Output Module adjusts the applied current until breakover is achieved.

Vdrm forces current and measures voltage at a specified Id on a sidac. The Output Module adjusts the applied current.

TRIAC/SCR

Igk measures the leakage current from the Gate to the Cathode on an SCR, or to A1 on a TRIAC. The Input Module forces the specified voltage on the Gate.

Igt applies a voltage from the Anode to the Cathode on an SCR, from A2 to A1 on a TRIAC. The Gate current undergoes binary adjustment until the voltage drops below half.

IgtH uses the Holding Test Head and applies a voltage from the Anode to the Cathode on an SCR, from A2 to A1 on a TRIAC. The Gate current undergoes sweep adjustment until the voltage drops below half.

Ihold measures the holding current by first triggering the SCR or TRIAC, then removing the trigger, then adjusting the Output Module (Anode) past zero. See IholdH to use pre-installed networks in the Holding Test Head for this measurement. [Requires 0201318 I-Hold Network Test Head]

IholdH measures the holding current by first triggering the SCR or TRIAC, then removing the trigger, then adjusting the Output Module (Anode) past zero. When the Output Module sweeps down, the Holding Test Head adjusts down until the trip point is reached. [Requires 0201318 I-Hold Network Test Head]

Irm measures the leakage current from Anode to Cathode on an SCR, from A2 to A1 on a TRIAC. The Output Module forces the specified voltage.

IrmR measures the leakage current from A2 to A1, quadrant III. The Output Module forces the specified voltage.

Vgk measures the breakdown voltage from the Gate to the Cathode on an SCR, or to A1 on a TRIAC. The Input Module forces the specified current.

Vgt measures the Gate trigger voltage by applying a specified voltage from Anode to Cathode on an SCR, or from A2 to A1 on a TRIAC. The Gate current undergoes binary adjustment until the voltage drops below half. See VgtH to use networks in the Holding Test Head.

VgtH measures the Gate trigger voltage using pre-installed networks in the Holding Test Head. The VgtH module applies a voltage from Anode to Cathode on an SCR, or from A2 to A1 on a TRIAC. The Gate current undergoes sweep adjustment until the voltage drops below half.

Vtm measures the voltage drop from Anode to Cathode on an SCR, or from A2 to A1 on a TRIAC, with Anode, or A2, and Gate current applied.