INSTRUCTION MANUAL

B+K PRECISION **530**

Semiconductor Tester

B+K PRECISION

A Product of DYNASCAN CORPORATION • 6460 W. Cortland St. • Chicago, Illinois 60635

PRICE $5.00

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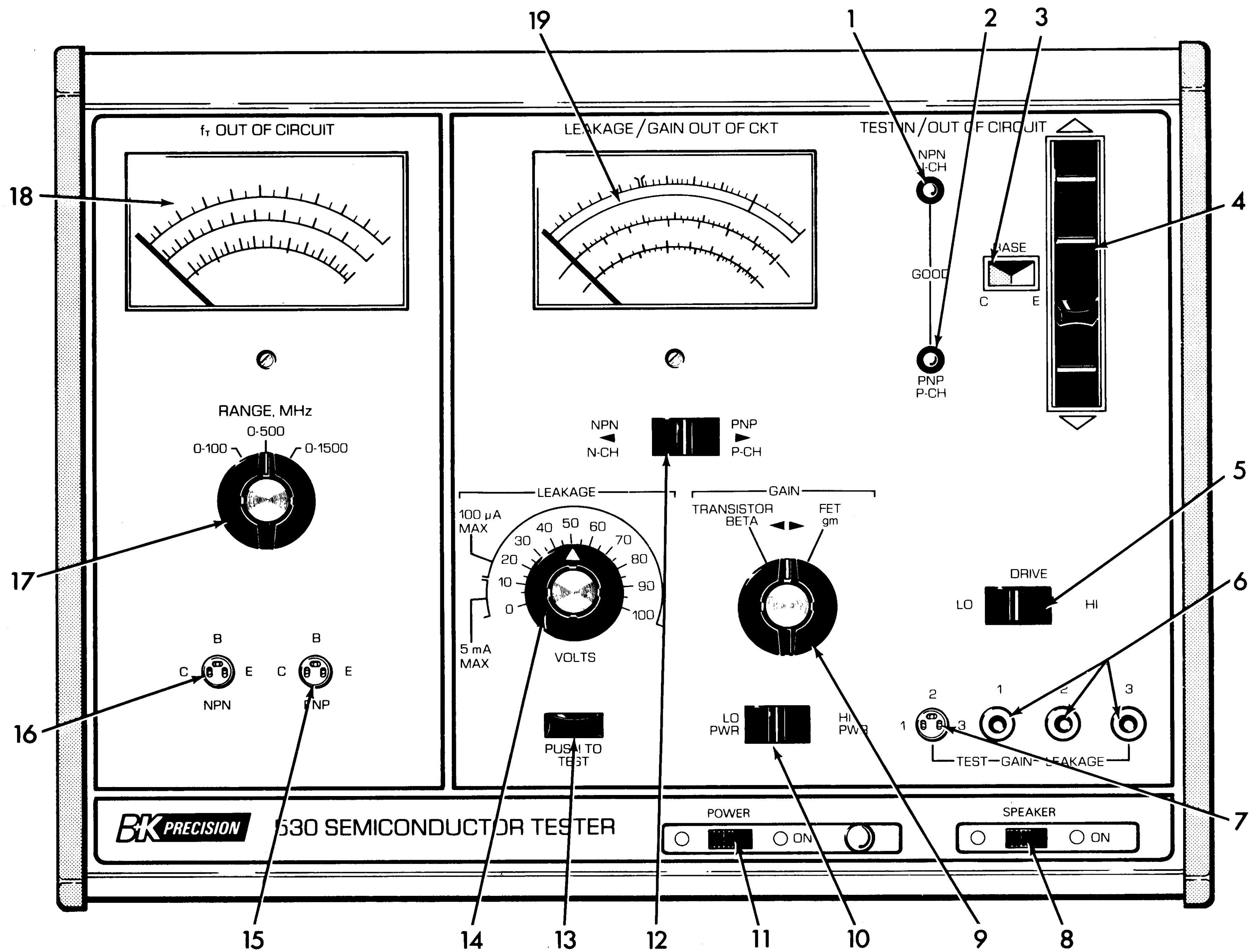

Fig. 1. Model 530 controls and indicators.

CONTROLS AND INDICATORS
(Refer to Fig. 1)

1. **NPN/N-CH Light.**
Lights when an NPN transistor or N-channel FET tests good.

2. **PNP/P-CH Light.**
Lights when a PNP transistor or P-channel FET tests good.

3. **Lead Identification Window.**
Identifies leads of device under test. Colors in the window are keyed to those of the Test Lead Sockets (6).

4. **Test Switch.**
Selects proper device connections for testing and lead identification.

5. **DRIVE Switch.**
Selects drive levels required for the identification tests.

6. **Test Lead Sockets.**
These sockets are receptacles for the test leads provided with the unit. The colors are keyed to the lead identification window (3) for identification of device terminals.

7. **Device Test Socket.**
Out-of-circuit tests can be performed by inserting the device into this socket. The terminals of this socket are internally connected in parallel with those of Test Lead Sockets (6).

8. **SPEAKER-ON Switch.**
Used to turn on or disable the audible test signal provided, as desired.

9. **TRANSISTOR BETA/FET gm Test Selector Switch.**
Selects required test conditions for transistor or FET tests.

10. **LO PWR/HI PWR Test Selector Switch.**
Selects test conditions for low-power or high-power devices. This applies to bipolar transistors as well as FET's.

11. **POWER-ON Switch.**
Turns unit power on or off. The adjacent indicator lights up when unit is turned on.

12. **NPN/PNP Test Selector Switch.**
Selects proper test conditions for out-of-circuit leakage and gain measurements. The required switch position is determined by which light, (1) or (2), is lighted in the good-bad test.

13. **PUSH-TO-TEST Switch.**
This switch must be depressed to obtain leakage and voltage breakdown measurements when using the LEAKAGE VOLTS control (14).

14. **LEAKAGE VOLTS Control.**
Used to adjust the test voltage for leakage and voltage breakdown tests (PUSH-TO-TEST Switch must be depressed for application).

15. **PNP Transistor Test Socket for f_T.**
Used for f_T measurements of PNP transistors only.

16. **NPN Transistor Test Socket for f_T.**
Used for f_T measurements of NPN transistors only.

17. **RANGE, MHz Switch for f_T.**
Selects frequency range for f_T measurements.

18. **f_T OUT-OF-CIRCUIT Meter.**
Provides f_T indication for transistor under test when used in conjunction with range switch (17).

19. **LEAKAGE/GAIN OUT-OF-CKT Meter.**
Indicator for all out-of-circuit leakage and gain measurements. (See Fig. 2.)

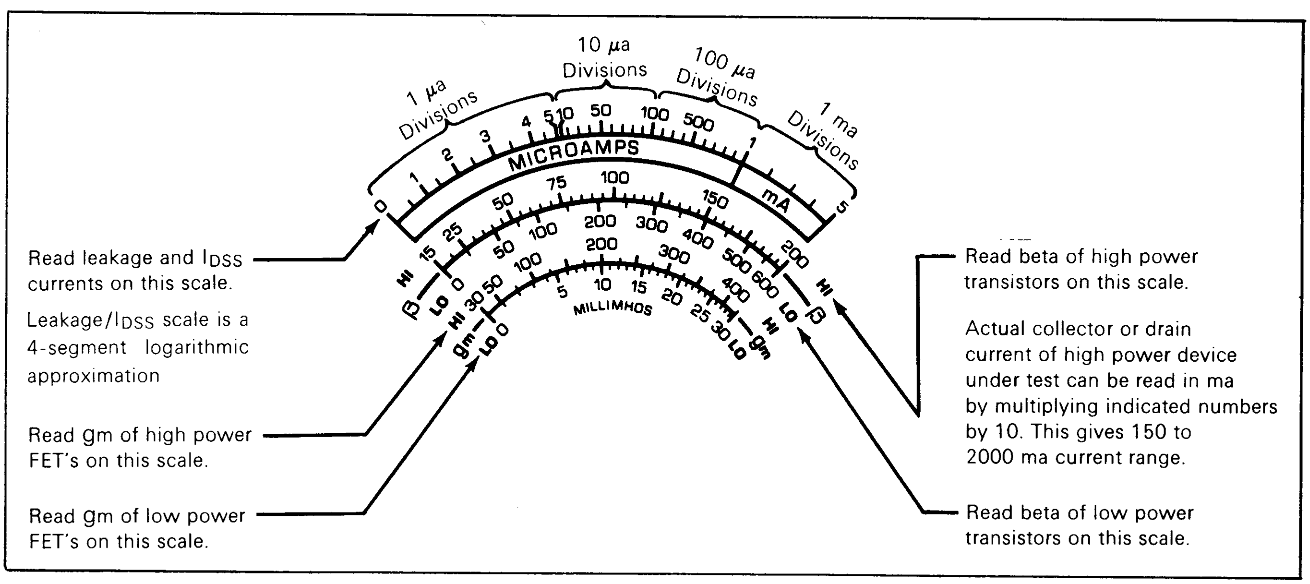

Fig. 2. Leakage/gain meter scales.

IN-CIRCUIT TESTING

CAUTION

Make sure all power is turned off in the circuit being tested, and that all capacitors are discharged.

A. Transistors and FET's:

1. Set the DRIVE Switch (5) to the LO position.

2. Connect the three test leads (in any manner) to the three leads of the device you wish to test. The test leads must be plugged into their respective color Test Lead Sockets (6).

3. Move the Test Switch (4) slowly through its six positions until one of the two red lamps (1) or (2), glows. A tone also will be heard if SPEAKER Switch (8) is ON. The lamp that glows indicates whether the device is NPN (1) or PNP (2) or N or P channel. In LO drive, most transistors that test good will do so in only *one* Test Switch position (see "THINGS TO KNOW ABOUT THE 530"). In this Test Switch position, all the leads of the transistor can be identified as shown in the Lead Identification Window (3). Most FET's will test good (LO or HI drive) in *two* Test Switch positions having the same BASE color shown in the Lead Identification Window (3), since practically all junction FET's are symmetrical. The BASE color indicated is the *gate* lead of the FET.

4. If there is *no* good indication (neither of the two lamps glows) as the Test Switch (4) is slowly moved through its six positions, in LO drive, then the device under test is one of the following:

   a. Device with high leakage or very low gain (may not function properly in circuit).

   b. Device with open/shorted elements.

   c. Device with excessive circuit shunting (see "SPECIFICATIONS").

   d. FET that will not test with LO drive.

5. Re-test the device, using HI drive. In HI drive, most transistors that test good will do so in *two* adjacent Test Switch positions having the same BASE color shown in the Lead Identification Window. Only the base lead of the transistor can then be identified.

6. If the device tests good using HI drive, then 4(a) or 4(d) above could be true.

7. If the device does not test good in any Test Switch position, in HI drive, remove the device from the circuit and re-test using OUT-OF-CIRCUIT procedures.

B. SCR's:

1. Set the DRIVE switch (5) to the HI position.

2. Connect the three test leads (in any manner) to the three leads of the SCR you wish to test.

3. Move the Test Switch (4) slowly through its six positions until the NPN lamp (1) glows in one position and PNP lamp (2) glows in another position having a different BASE color as shown in the Lead Identification Window (3).

4. The SCR is good *only* if the following indications are obtained:

   a. One NPN.

   b. One PNP.

NOTE: indications must not have same BASE color.

LEAD IDENTIFICATION:

   a. The BASE color shown in the Lead Identification Window (3) is the *gate* lead when the NPN lamp (1) glows.

   b. The BASE color shown in the Lead Identification Window is the *cathode* lead when the PNP (2) lamp glows.

5. If the SCR tests *bad,* then it should be removed from the circuit and tested again (may be subject to excessive shunting in-circuit), using out-of-circuit procedures.

C. Diodes:

1. Set LEAKAGE VOLTS control (14) to zero.

2. Set Test Switch (4) to top position (Green base identification).

3. Set NPN/PNP Switch (12) to PNP.

4. Connect the blue and yellow test leads across the diode to be tested.

5. Adjust the LEAKAGE VOLTS Control (14) to approximately 10 volts, as indicated on the control panel.

6. Depress the PUSH-TO-TEST Switch (13) and, while keeping this switch depressed, rotate the Test Switch (4) to each of the upper two positions. (Green base identification.)

7. While performing step 6, observe the results on LEAKAGE/GAIN Meter (19). The meter reading will be approximately full scale for one position of Test Switch (4) while the other position of the Test Switch will give a lower reading, depending on the shunting effect of the circuitry. In the position giving the highest reading, the *cathode* of the diode under test is connected to the test lead having the collector (C) color in the Lead Identification Window (3). If both positions produce full-scale readings the diode is either shorted or heavily shunted by low-resistance circuitry; for example, a transient suppressor diode across a relay or a solenoid coil. In this case the diode should be disconnected from the circuit and re-tested using OUT-OF-CIRCUIT procedures.

D. **"Hands Off" Testing:**

When the base lead of devices being tested can be identified, leave the Test Switch in the uppermost position. The transistors can then be probed one-by-one, by connecting the green lead to the base, and the blue and yellow leads to the collector and emitter, respectively. The audible tone will tell you when the transistor is good. Occasionally, the collector and emitter leads may have to be interchanged to produce a tone.

The "Hands Off" method is useful when it is necessary to test a number of transistors in a circuit, or when it is impossible to connect all three leads to the device being tested. If one lead can be clipped onto the device, both hands will be free to probe the remaining two leads. With this feature, you can also use the **B & K-Precision** DYNAFLEX MODEL FP-5 PROBE (optional) to test devices from either side of the P.C. board.

E. **Intermittent Testing:**

Often the Model 530 can be used to identify intermittent transistors in a circuit. Connect the test leads to the suspected transistors and move the TEST Switch until the tone is heard. Then, leaving the 530 in this position, the transistor can be subjected to various physical tests such as tapping, heating, or cooling. An intermittent transistor will be indicated by an intermittent tone. A can of "Instant Cold Spray" is quite useful for providing rapid cooling of discrete components.

OUT-OF-CIRCUIT TESTING

A. **Transistors:**

1. Good-Bad Tests (power and signal transistors).

   a. Set the DRIVE Switch (5) to the LO position.

   b. Insert the transistor into Device Test Socket (7), or connect the three test leads (in any manner) to the three leads of the transistor you wish to test. The test leads must be plugged into their respective color Test Lead Sockets (6).

   c. Move the Test Switch (4) slowly through its six positions until one of the two red lamps, (1) or (2), glows. A tone also will be heard if SPEAKER Switch (8) is ON. The lamp that glows indicates whether the device is NPN (1) or PNP (2). In LO drive, most transistors that test good will do so in only *one* Test Switch position (see "THINGS TO KNOW ABOUT THE 530"). In this Test Switch position, all the leads of the transistor can be identified as shown in the Lead Identification Window (3).

   d. If there is *no* good indication (neither of the two lamps glows) as the Test Switch (4) is slowly moved through its six positions, in LO drive, then the device under test is one of the following:

      (1) Transistor with high leakage or very low gain (may not function properly in circuit).

      (2) Device with open/shorted elements.

      (3) FET that will not test with LO drive. Verify before proceeding.

      (4) Device is a Power Darlington type, which requires high base drive voltage. Re-test, using HI drive, after verifying that device is a Darlington.

   e. A transistor which tests *good* can be further evaluated for beta, f_T and voltage breakdown.

2. Beta Tests:

   a. Place the Test Switch (4) in the position in which all transistor leads are properly identified.

   b. Set the NPN/PNP Switch (12) to the position indicated by *good* test light (1) or (2).

   c. Place the LO PWR/HI PWR Switch (10) in the appropriate position, depending on the type of transistor to be tested. If no information is available for the transistor under test, the physical size generally indicates whether it is intended for high-power or low-power applications; regardless, the transistor will not be damaged if tested in both positions. In fact, a high-current and low-current beta test can be performed for any transistor.

   d. Turn the TRANSISTOR BETA/FET g_m Switch (9) to the TRANSISTOR BETA position and observe the LEAKAGE/GAIN Meter (19). Read the transistor gain on the LO or HI beta (β) scale of meter (19) depending upon whether the LO PWR or HI PWR position, respectively, of switch (10) is selected. The beta reading is given directly on each scale.

   e. If there is any doubt about the proper lead identification, note the beta reading of step "d" above and then place the Test Switch (4) in the adjacent position which has the same base color identification as observed in the Lead Identification Window (3). Hold the TRANSISTOR BETA/FET g_m Switch (9) in the TRANSISTOR BETA position and observe the beta reading obtained on meter (19). The higher reading corresponds to the proper position of Test Switch (4). The Test Switch position giving the lower beta reading is the reverse beta (collector and emitter interchanged).

   f. As a further aid in device identification, the Model 530 is designed so that no reading is obtained in step "d" if the device under test is a FET. If a reading is obtained with the TRANSISTOR BETA/FET g_m Switch (9) in the FET g_m position, the device under test is a FET and the gain or g_m, is observed on the appropriate g_m scale of the LEAKAGE/GAIN meter (19).

3. f_T Tests:

Measurement of the f_T parameters of bipolar transistors is complex in theory and performance. A detailed explanation of f_T measurements is provided in the appendix of this manual.

When measuring f_T, it is important to know that, with some transistors, the same meter deflection may occur on two ranges, such as the 0-100 MHz and the 0-500 MHz ranges. The f_T of the transistor is *always* the range reading that gives the highest numerical value (in this example, the reading on the 0-500 range applies).

a. To obtain reliable information regarding the frequency characteristics of the transistor under test, the lead identification and polarity of the device must be known as determined in the previous tests.

b. Insert the transistor under test into the appropriate f_T test socket (15) or (16). The transistor leads must properly match the socket lead designations. If the device cannot be made to fit into the socket provided, use the three-lead adapter provided to make the connections to the transistor. Note that any additional lead length can be detrimental to the accuracy of this test; therefore, the three-lead adapter should be used only if absolutely necessary.

c. Set the f_T RANGE MHz Switch (17) to the 0-1500 range and read the value on the f_T meter (18) on the 1500 MHz scale.

d. If the reading is greater than 300, this is the f_T of the transistor under test.

e. If the observed reading is less than 300, set the RANGE, MHz switch (17) to the 0-500 range and observe the meter (18). If the reading is greater than 50, this is the f_T of the transistor under test.

f. If the observed reading is less than 50, set the RANGE, MHz switch (17) to the 0-100 range and observe meter (18). This is the f_T reading of the transistor under test. The accuracy of readings below 5 on this range is questionable.

g. If there is a difference in readings on two ranges where the scales overlap, the largest absolute value for f_T is the most accurate.

NOTE ON VOLTAGE AND BREAKDOWN TESTS

All voltage and breakdown tests outlined here eliminate the need to know the device lead identification when beginning the test. In cases when the device lead identification *is* known, the following table indicates the connections required for the device tests. The indicated positions of Test Switch (4) correspond to the uppermost for position 1 and the adjacent position for position 2. Both of these Test Switch positions have the green base identification in Lead Identification Window (3). Connections can be made to the test leads provided or the device can be inserted into Test Socket (7). The required connections are indicated by an "X". Where no connection is required, "NC" is entered.

TEST LEAD COLOR AND NUMBER

Device Tests	Yellow (3) Emitter	Green (2) Base	Blue (1) Collector	Test Switch Position
BV_{CES}, I_{CES}	X	X	X	1
BV_{CEO}, I_{CEO}	X	NC	X	1
BV_{CBO}, I_{CBO}	NC	X	X	1
BV_{ECS}, I_{ECS}	X	X	X	2
BV_{ECO}, I_{ECO}	X	NC	X	2
BV_{EBO}, I_{EBO}	X	X	NC	2

4. BV_{CES} (Collector-Emitter Breakdown Voltage With Base Shorted to Emitter):

a. Connect transistor to the test leads or plug it into the test socket (7).

b. Make sure the DRIVE switch (5) is in the LO position.

c. Move the Test Switch (4) to the position which produces a *good* indication, as indicated by the polarity lights (1) or (2).

NOTE

If the good-bad test of paragraph "A-1" results in a *good* indication in two adjacent positions of Test Switch (4), the collector can be identified by observations during the leakage test as follows:

- Set the LEAKAGE VOLTS Control (14) to about 10 volts.
- Depress the PUSH-TO-TEST Switch (13) and move the Test Switch (4) between the two positions which gave a good indication.
- The Test Switch (4) position which gives the lowest indicated current on LEAKAGE/GAIN Meter (19) is the position in which all transistor leads can be identified.

d. Set the NPN/PNP Switch (12) to the position corresponding to the polarity light (1) or (2) which lights.

e. Set the LEAKAGE VOLTS Control (14) to zero.

f. Depress the PUSH-TO-TEST button (13) and slowly increase the LEAKAGE VOLTS Control until a sharp increase or sudden change in current is observed on LEAKAGE/GAIN Meter (19). The voltage indicated on the panel is the collector-emitter breakdown voltage with the base shorted to the emitter (BV_{ces}). For an exact measurement of this voltage, connect a high-impedance voltmeter across the collector and emitter terminals of the device under test. Do not leave the voltmeter connected after the voltage measurement.

5. I_{CES} (Collector-Emitter Current With Base Shorted to Emitter):

This current is a specified limit at a specified test voltage. If these values are known, proceed as follows:

a. Leave Test Switch (4) in the test position used in the previous test.

b. The transistor connections are the same as in the previous test.

c. If only an approximate voltage indication is required, the panel calibration of the LEAKAGE VOLTS Control (14) can be used. If the exact test voltage is desired, connect a high-impedance voltmeter to the emitter and collector terminals of the device under test.

d. Depress the PUSH-TO-TEST Button (13) and set the LEAKAGE VOLTS Control (14) to the specified test voltage.

e. Disconnect the voltmeter, if used, after the test voltage has been set; otherwise the leakage current measurement will be in error.

f. With the PUSH-TO-TEST button (13) depressed, observe the leakage current as indicated on LEAKAGE/GAIN meter (19). This is the I_{CES} value of the device under test.

6. BV_{CEO} (Collector-Emitter Breakdown Voltage With Base Open):

a. After determining the proper position of Test Switch (4) in paragraph "2" above, disconnect the base lead, either by disconnecting the test lead if so connected, or by bending the base lead and inserting the transistor in the test socket (7) so that only the emitter and collector leads are connected. *Be sure that the unconnected lead does not touch the panel.*

b. Set LEAKAGE VOLTS Control (14) to zero.

c. Depress the PUSH-TO-TEST button (13) and slowly increase the LEAKAGE VOLTS control (14) until a sharp increase or sudden change in current is observed on LEAKAGE/GAIN meter (19). The voltage indicated on the panel is the BV_{CEO} value.

7. I_{CEO} (Collector-Emitter Current With Base Open):

This current is a specified limit at a specified test voltage. If these values are known, proceed as follows:

a. Leave Test Switch (4) in the test position used in the previous test.

b. The transistor connections are the same as in the previous test.

c. If only an approximate voltage indication is required, the panel calibration of the LEAKAGE VOLTS control (14) can be used. If the exact test voltage is desired, connect a high-impedance voltmeter to the emitter and collector terminals of the device under test.

d. Depress the PUSH-TO-TEST button (13) and set the LEAKAGE VOLTS control to the specified test voltage.

e. Disconnect the voltmeter, if used, after the test voltage has been set; otherwise the leakage current measurement will be in error.

f. With the PUSH-TO-TEST button (13) depressed, observe the leakage current as indicated on LEAKAGE/GAIN meter (19). This is the I_{CEO} value of the device under test.

8. BV_{CBO} (Collector-Base Breakdown Voltage With Emitter Open):

a. After determining the proper position of Test Switch (4) in paragraph "2" above, connect to, or insert the transistor under test into test socket (7) so that only the collector and base leads are connected.

b. Set the LEAKAGE VOLTS control (14) to zero.

c. Depress the PUSH-TO-TEST button (13) and slowly increase the LEAKAGE VOLTS control (14) until a sharp increase or sudden change in current is observed on LEAKAGE/GAIN meter (19). The voltage indicated on the panel is the BV_{CBO} value.

9. I_{CBO} (Collector-Base Current With Emitter Open):

This current is a specified limit at a specified test voltage. If these values are known, proceed as follows:

a. Leave Test Switch (4) in the test position used in the previous test.

b. The transistor connections are the same as in the previous test.

c. If only an approximate voltage indication is required, the panel calibration of the LEAKAGE VOLTS control (14) can be used. If the exact test voltage is desired, connect a high-impedance voltmeter to the base and collector terminals of the device under test.

d. Depress the PUSH-TO-TEST button (13) and set the LEAKAGE VOLTS control (14) to the specified test voltage.

e. Disconnect the voltmeter, if used, after the test voltage has been set; otherwise the leakage current measurement will be in error.

f. With the PUSH-TO-TEST button (13) depressed, observe the leakage current as indicated on LEAKAGE/GAIN meter (19). This is the I_{CBO} value of the device under test.

10. BV_{EBO} (Reverse Emitter-Base Breakdown Voltage With Collector Open):

a. Set the LEAKAGE VOLTS Control (14) to zero.

b. Set the Test Switch (4) to the position adjacent to that used for the BV_{CES} test of paragraph "2" which has the same base color indication in Lead Identification Window (3).

c. Disconnect the collector lead, either by disconnecting the test lead if so connected, or by bending the collector lead and inserting the transistor in Test Socket (7) so that only the emitter and base leads are connected.

d. Depress the PUSH-TO-TEST switch (13) and adjust the LEAKAGE VOLTS Control (14) until a sharp increase or sudden change in current is observed on LEAKAGE/GAIN meter (19). This is the BV_{EBO} voltage of the device under test. This voltage can be measured accurately by connecting a high-impedance voltmeter across the base and emitter terminals of the device under test. Do not leave the voltmeter connected after the voltage is adjusted.

11. I_{EBO} (Reverse Emitter-Base Current With Collector Open):

This current is a specified limit at a specified test voltage. If these values are known, proceed as follows:

a. Leave Test Switch (4) in the test position used in the previous test.

b. The transistor connections are the same as in the previous test.

c. If only an approximate voltage indication is required, the panel calibration of the LEAKAGE VOLTS control (14) can be used. If the exact test voltage is desired, connect a high-impedance voltmeter to the emitter and base terminals of the device under test.

d. Depress the PUSH-TO-TEST button (13) and set the LEAKAGE VOLTS control (14) to the specified test voltage.

e. Disconnect the voltmeter, if used, after the test voltage has been set; otherwise the leakage current measurement will be in error.

f. With the PUSH-TO-TEST button (13) depressed, observe the leakage current as indicated on LEAKAGE/GAIN meter (19). This is the I_{EBO} value of the device under test.

12. BV_{ECO} (Reverse Emitter-Collector Breakdown Voltage With Base Open):

a. Set the LEAKAGE VOLTS Control (14) to zero.

b. Set the Test Switch (4) to the position adjacent to that used for the BV_{CES} test of paragraph "2" which has the same base color indication in Lead Identification Window (3).

c. Disconnect the base lead, either by disconnecting the test lead if so connected, or by bending the base lead and inserting the transistor in Test Socket (7) so that only the emitter and collector leads are connected.

d. Depress the PUSH-TO-TEST switch (13) and adjust the LEAKAGE VOLTS control (14) until a sharp increase or sudden change in current is observed on LEAKAGE/GAIN meter (19). This is the BV_{ECO} voltage of the device under test. This voltage can be measured accurately by connecting a high-impedance voltmeter across the collector and emitter terminals of the device under test. Do not leave the voltmeter connected after the voltage is adjusted.

13. I_{ECO} (Reverse Emitter-Collector Current With Base Open):

This current is a specified limit at a specified test voltage. If these values are known, proceed as follows:

a. Leave Test Switch (4) in the test position used in the previous test.

b. The transistor connections are the same as in the previous test.

c. If only an approximate voltage indication is required, the panel calibration of the LEAKAGE VOLTS control (14) can be used. If the exact test voltage is desired, connect a high-impedance voltmeter to the emitter and collector terminals of the device under test.

d. Depress the PUSH-TO-TEST button (13) and set the LEAKAGE VOLTS control (14) to the specified test voltage.

e. Disconnect the voltmeter, if used, after the test voltage has been set; otherwise the leakage current measurement will be in error.

f. With the PUSH-TO-TEST button (13) depressed, observe the leakage current as indicated on LEAKAGE/GAIN meter (19). This is the I_{ECO} value of the device under test.

14. BV_{ECS} (Reverse Emitter-Collector Breakdown Voltage With Base Shorted to Collector):

a. Set the LEAKAGE VOLTS Control (14) to zero.

b. Set the Test Switch (4) to the position adjacent to that used for the BV_{CES} test of paragraph "2" which has the same base color indication in Lead Identification Window (3).

c. Connect the transistor to the test leads or plug it into Test Socket (7).

d. Depress the PUSH-TO-TEST switch (13) and adjust the LEAKAGE VOLTS control (14) until a sharp increase or sudden change in current is observed on LEAKAGE/GAIN meter (19). This is the BV_{ECS} voltage of the device under test. This voltage can be measured accurately by connecting a high-impedance voltmeter across the collector and emitter terminals of the device under test. Do not leave the voltmeter connected after the voltage is adjusted.

15. I_{ECS} (Reverse Emitter-Collector Current With Base Shorted to Collector):

This current is a specified limit at a specified test voltage. If these values are known, proceed as follows:

a. Leave Test Switch (4) in the test position used in the previous test.

b. The transistor connections are the same as in the previous test.

c. If only an approximate voltage indication is required, the panel calibration of the LEAKAGE VOLTS control (14) can be used. If the exact test voltage is desired, connect a high-impedance voltmeter to the emitter and collector terminals of the device under test.

d. Depress the PUSH-TO-TEST button (13) and set the LEAKAGE VOLTS control (14) to the specified test voltage.

e. Disconnect the voltmeter, if used, after the test voltage has been set; otherwise the leakage current measurement will be in error.

f. With the PUSH-TO-TEST button (13) depressed, observe the leakage current as indicated on LEAKAGE/GAIN meter (19). This is the I_{ECS} value of the device under test.

B. FET's:

1. Good-Bad Test (Power and Signal FET's):

a. Set the DRIVE switch (5) to the HI position.

b. Connect the device to the test leads at Test Lead Sockets (6) or insert in Test Socket (7).

c. Slowly move Test Switch (4) until the Model 530 indicates a good FET. Lamp (1) or (2) will light and a tone will be heard if the SPEAKER switch (8) is ON.

d. J-FET's will indicate good in *two* adjacent Test Switch position which have the same BASE color. (Most J–FET's are symmetrical).

e. The BASE color shown in the Lead Identification Window (3) is the *gate.*

f. If no good indication is received, then the FET under test is defective.

g. A FET which tests good can be further evaluated as indicated in the following steps. Before proceeding, make sure the device polarity has been determined as indicated by lights (1) or (2).

2. g_m Tests:

a. Move the Test Switch (4) to a position which produces a good indication.

b. Set the NPN/PNP switch (12) to the device polarity indicated by light (1) or (2).

c. Place the LO PWR/HI PWR switch (10) in the appropriate position, depending on the type of FET to be tested. If no information is available for the FET under test, the physical size generally indicates whether it is intended for high-power or low-power applications; regardless, the device will not be damaged if tested in both positions. In fact, a high-current and low-current g_m test can be performed for any FET.

d. Turn the TRANSISTOR BETA/FET g_m switch (9) to the FET g_m position.

e. Read the g_m for the FET on the appropriate g_m scale of LEAKAGE/GAIN meter (19).

CAUTION

Junction FET's can be driven into conduction and reverse breakdown by the Model 530, without damage. MOS FET's however, *can* be permanently damaged if breakdown voltages are exceeded. To avoid damage to a FET which is not positively identified as a Junction type or MOS type, do not exceed 10 volts in any of the following tests. Where the device is properly identified and test data is available, the device can be tested to specified limits as outlined in the following tests.