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Demonstration Outline

Demonstration Purpose:

Establish to a reasonable certainty whether the circuit published in: "Experimental Evidence of a Breach of Unity Measured on Switched Circuit Apparatus" Figure 1, exhibits anomalous energy output that justifies further research.

Claims:

It is claimed that when the apparatus is operated under particular conditions that:

1. The average power over many cycles emitted by a heating element that is part of the apparatus far exceeds the recognized input electrical power to the apparatus averaged an integer number of cycles approximating the same time interval.
   a. The extent of the excess is at least 5:1.
   b. The excess can be shown with a thermal power output of at least 5 Watts.

Demonstration Strategy:

Input power is electrical. The apparatus is powered from a lead acid battery bank and by conventional theory exchanges some power with a function generator that is part of the test set-up. The test set-up includes test points for measuring battery current as the voltage measured across a set of four current sense resistors, and voltage across the battery input connections on a test board. These connections are schematically represented in the schematic of Figure 1. The demonstration fixture includes additional facility to measure current as voltage across a current sense resistor located directly at the negative terminal of the battery, and voltage directly across the battery bank. These connections are also shown in Figure 1. All loop current flows through each: The $\mathbf{R}_{SHUNT}$ resistor bank on the test board and $\mathbf{R}_{SHUNT2}$ located at the battery.

In order to prevent ground loops between the oscilloscope probe grounds and the function generator black lead through the mains earth connection: The function generator earth connection will be isolated by connecting through an extension cord where the earth terminal has been removed.

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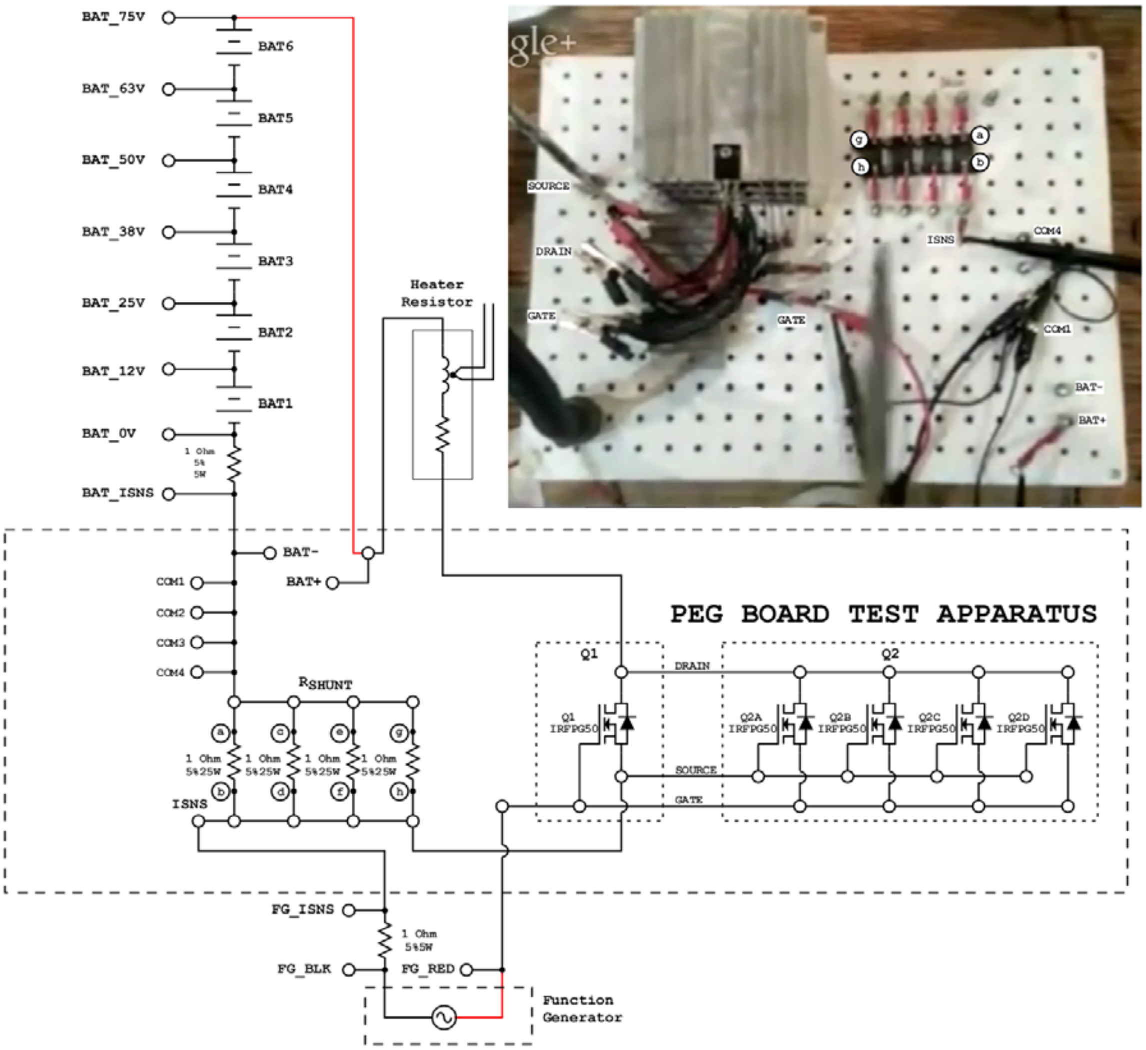

Figure 1, 8/11 Demonstration Schematic

Output power is thermal. The demonstrator is not equipped to perform calibrated calorimetry on the heater output. The demonstrator will instead operate the apparatus first under the conditions believed to generate the excess output thermal power. The temperature rise of a thermocouple located on the heating element itself, versus a second thermocouple located in view of the camera, thermally isolated from the heating element or other sources of heat on the test apparatus, and exposed to ambient air near the apparatus. The output thermal power at the recorded temperature rise will be determined by later applying DC drive to the heater from a bench power supply, adjusting the supply as needed to obtain the same temperature rise as found during the active test, and recording the measured current and voltage indicated on a pair of digital multi-meters.

In order to minimize comparative error sources between the active test and the DC heater test, both tests will measure current as the voltage across the current sense resistor bank. The bench power supply will replace only the battery connections to the test board, the drains of all five transistors will be disconnected and a jumper applied from the Q1 drain jumper post to the Q1 source jumper post. Heater voltage will be measured from the BAT+ monitor point on the test board, to the Q1 drain monitor point on the test board as indicated in Figure 5. A light ribbon will be suspended in proximity to the heating element during all tests so as to indicate air movement.

Demonstration Tests:

The demonstration tests will be conducted in five phases:

1. Demonstration of the preferred operating mode measuring battery voltage and current at the test board, and recording heater and ambient temperature. See Figure 2.

   The function generator will be adjusted to the preferred peak to peak amplitudes, offset voltage, operating frequency, and high duty-cycle of the demonstrator. The function generator settings will remain fixed for the remainder of the demonstration.

   Approximate function generator cycle timing will be in the range of 10Hz to 100kHz. similar to Paper 1, Figure 5. The function generator settings will remain fixed for the remainder of the demonstration.

   Once the set-up has been adjusted to the demonstrator's satisfaction, an initial screen capture will be taken that clearly shows several cycles of the oscillation during the function generator negative voltage phase at a sample rate at least ten times the oscillation frequency. The oscilloscope settings used will be reused in test phases 2, and 3 for the same purpose. The test will run Readings from each of the thermocouples and the mechanical thermometer will also be taken and recorded at this time.

   The remainder of the test will run with the scope set to a constant horizontal sweep, rate sufficient to show two to five cycles of the function generator high / low cycle, sampling at 100 Ms/s or more, triggered on Chl 3 rising edge at 0V. The oscilloscope settings used will be reused in test phases 2, 3, and 5. At the end of the phase a scope capture will be taken.

2. Continued demonstration of the preferred operating mode, relocating oscilloscope probes and grounds to measure function generator power transfer. See Figure 3.

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An initial screen capture will be taken that clearly shows several cycles of the oscillation during the function generator negative voltage phase using the identical oscilloscope settings as the initial capture in Phase 1.

The remainder of the test will run with the scope set to the same settings as the latter part of Phase 1. At the end of the phase a scope capture will be taken.

3. Continued demonstration of the preferred operating mode, relocating oscilloscope probes and grounds to measure battery voltage and current at the battery. See Figure 4.

   An initial screen capture will be taken that clearly shows several cycles of the oscillation during the function generator negative voltage phase using the identical oscilloscope settings as the initial capture in Phase 1.

   The remainder of the test will run with the scope set to the same settings as the latter part of Phase 1. At the end of the phase a scope capture will be taken.

4. Null heater power test to determine heater output power emitted during tests 1, 2, and 3. See Figure 5. Once powered, the power supply voltage will be adjusted until the stabilized temperature rise of the heater element matches the temperature rise recorded in Phase 1. The voltage reading across $\mathbf{R}_{SHUNT}$ (DMM2), and from BAT+ to Q1 drain post (DMM2) will be recorded along with the readings from each of the thermocouples and the mechanical thermometer.

5. Function generator open circuit measurement. The function generator will be connected only to the oscilloscope to record the open circuit voltage used during Test Phase 1, Test Phase 2, and Test Phase 3. Neither oscilloscope Chl 1, nor Chl 2 will be used and those channels will be turned-off and probes and probe grounds disconnected. Only Chl. 3 will be used. See Figure 6.

   The test will run with the scope set to the same settings as the latter part of Phase 1. At the end of the phase a scope capture will be taken.

Notes:

1. During all tests, heating element temperature will be measured by both a thermocouple. Ambient will be measured by both a mechanical thermometer and a thermocouple. The two thermocouple and mechanical thermometer readings will be recorded prior to application of any power in order to establish zero offset.

2. During all tests, power will be interrupted before recording thermocouple values.

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3. Test Phase 1, and Test Phase 4 will each be run at least long enough to establish that the heating element temperature has stabilized to a temperature that rises and falls by less than 1% in one minute.

4. The oscilloscope math channel will calculate the product of Channel 1 (current sense) and Channel 2 for tests 1-3. The product in each test will be scaled to compensate for the value of the current sense resistors: 0.25 Ohms in Test Phase 1, and 1.0 Ohms in Test Phase 2, and Test Phase 3.

5. Oscilloscope vertical gains will be set as:

    a. Channel 1 current: 2V / division, equivalent to 8 Amperes / division Test Phase 1, equivalent to 2 Amperes / division Test Phase 2, and Test Phase 3. Not used Test Phase 4, Test Phase 5.
    b. Channel 2 voltage: 100V / division Test Phase 1, and Test Phase 3. 10V / division Test Phase 2. Not used Test Phase 4, Test Phase 5.
    c. Channel 3, function Q1 gate voltage: 10V / division Test Phase 1, not used Test Phase 4. 5V / division Test Phase 5.

6. Parameter values are represented in good faith but may change due to dry-run experiments to be performed Aug-10-2013.

Post Test Activity:

Upon completion of all four test phases, the data obtained will be summarized, and the results discussed.

Test Phase 3 provides a reference check against the measurements obtained during Test Phase 1. In order for the measurements in Test Phase 1 to be considered valid, the Test Phase 1 computed average power magnitude must agree within +/-20% of the Test Phase 3 computed average power magnitude. Test Phase 1 computed average power direction must also agree with Test Phase 3 computed power direction.

If Test Phase 1 results are validated by correlation with Test Phase 3, the sum of Test Phase 1 and Test Phase 2 average power values together define the input electrical power during the preferred operating mode. If the input power so determined is less than 20% of the electrical power measured in Test Phase 4, then it will be reasonable to conclude that the tests indicate anomalous heater power output and further study is indicated. If the power so determined is more than 80% of the power measured in Test Phase 4, then it will be reasonable to conclude that no anomalous power output has been demonstrated.

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In the event that computed power during Test Phase 1 and Test Phase 3 do not correlate, then power values computed during Test Phase 3 will be used with the power values computed during Test Phase 2 to determine input electrical power during the preferred operating mode. If the input power so determined is less than 20% of the electrical power measured in Test Phase 4, then it will be reasonable to conclude that the tests indicate anomalous heater power output and further study is indicated. If the power so determined is more than 80% of the power measured in Test Phase 4, then it will be reasonable to conclude that no anomalous power output has been demonstrated.

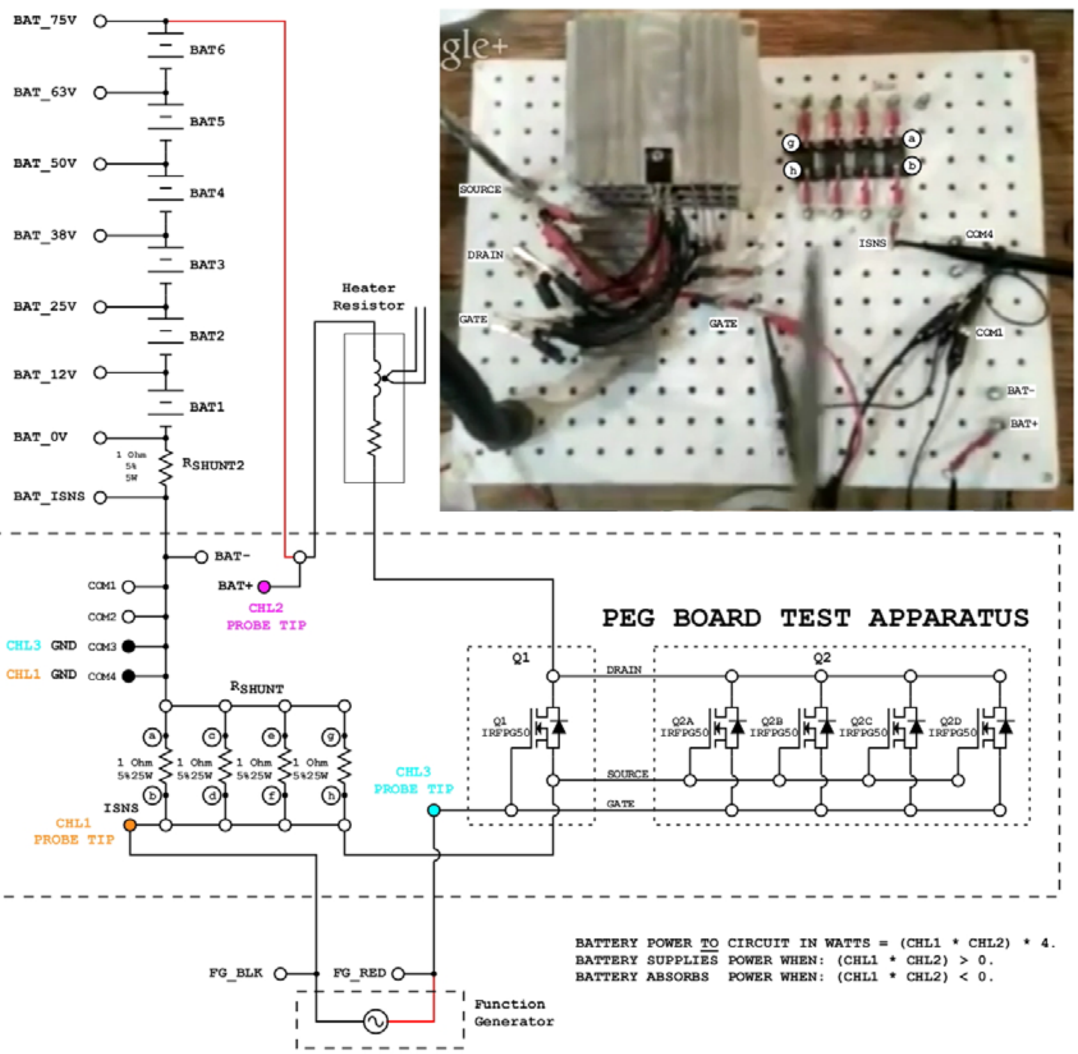

Figure 2, Test Phase 1 Test Configuration

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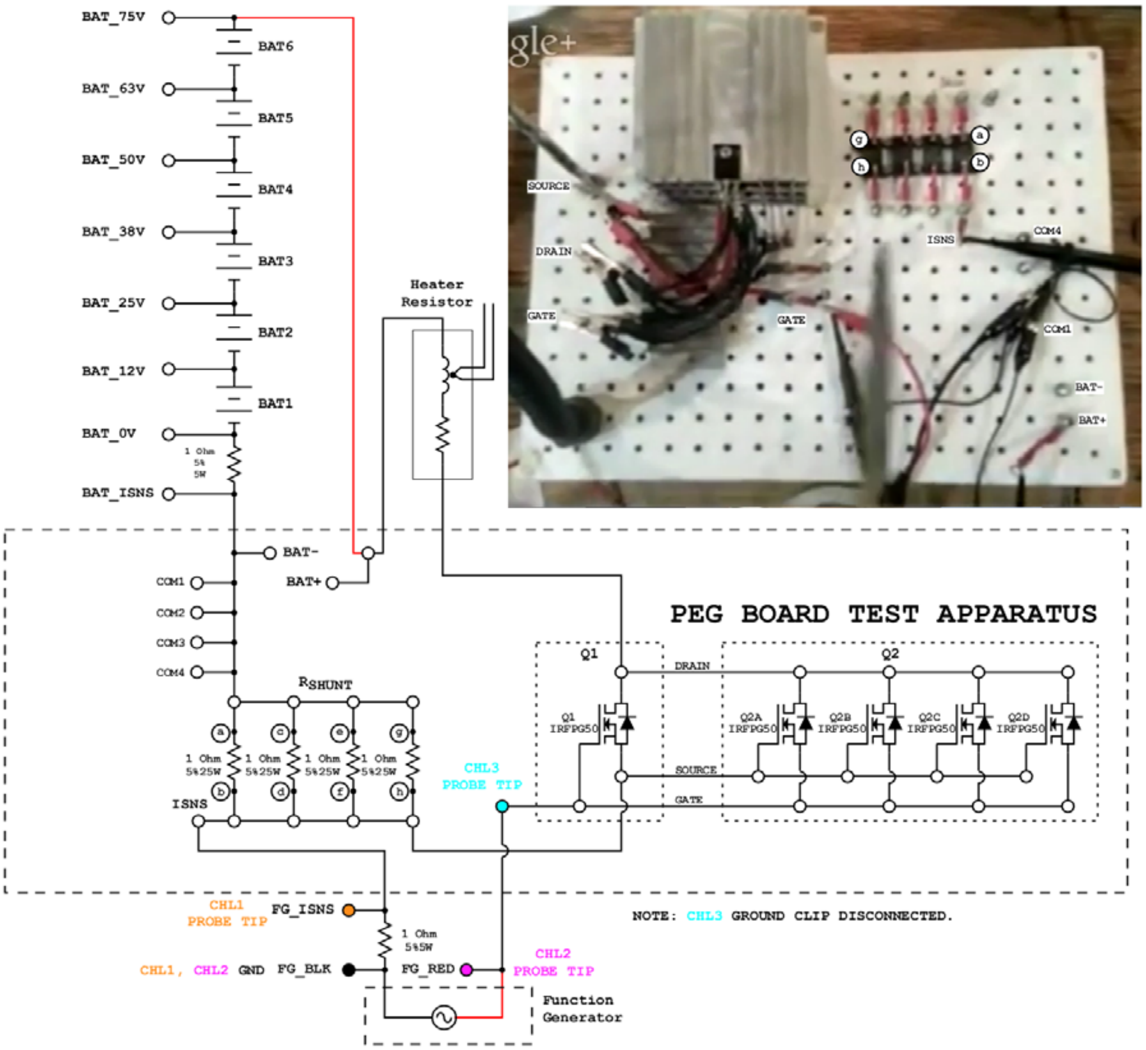

Figure 3, Test Phase 2 Test Configuration

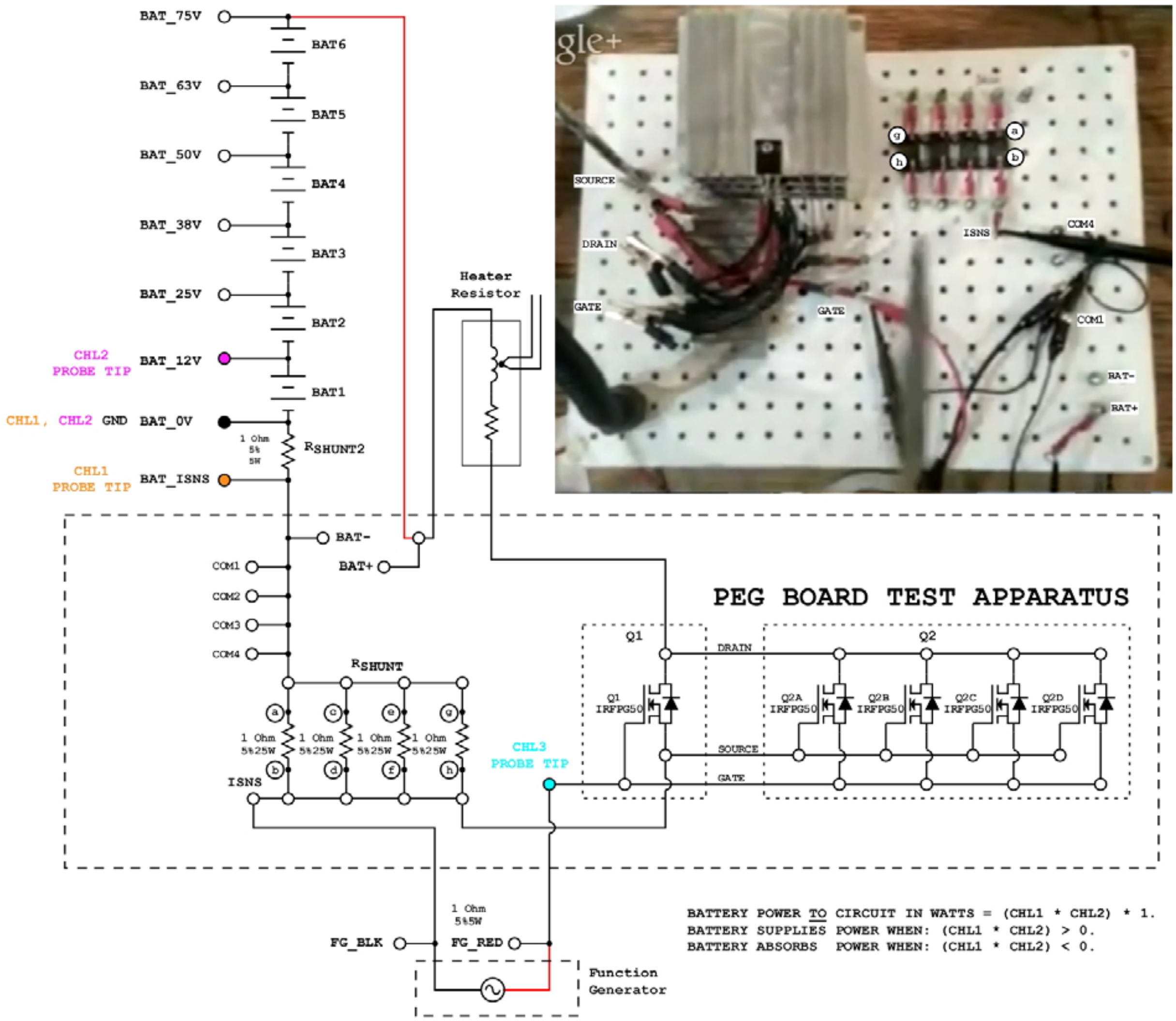

Figure 4, Test Phase 3 Test Configuration

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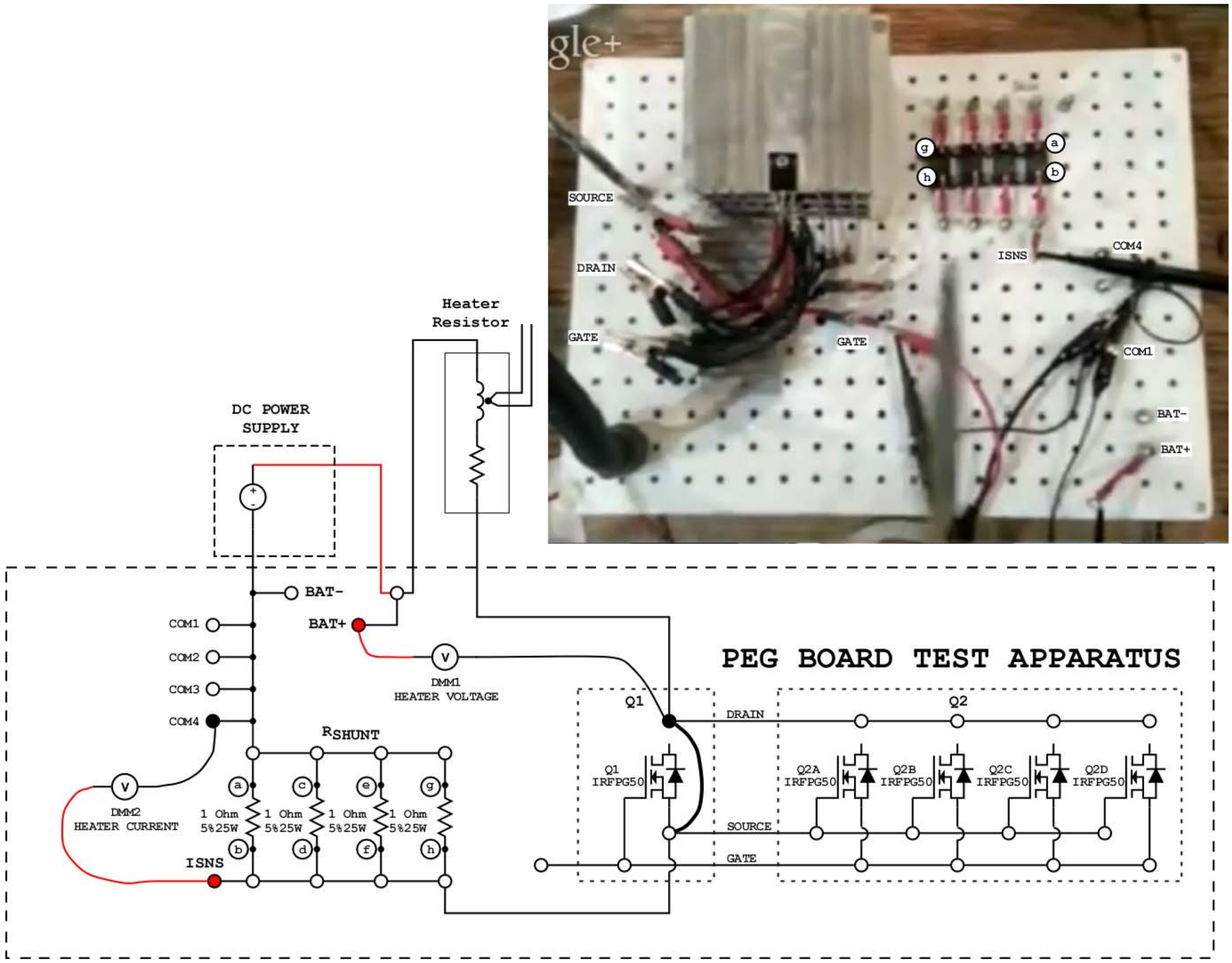

Figure 5, Test Phase 4 Test Configuration

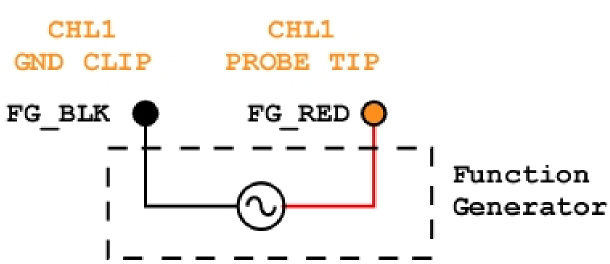

Figure 6, Test Phase 5 Test Configuration

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Appendix A: Paper 1 Heating Element Power to Temperature Calibration Data

Entered Data					Calculated Data						
Sample Time	Power Source		Temperature C		Temperature C		Applied Power	Step Time	Apparent Resistance	Resistance Deviation	Thermal Resistance
	Test Voltage	Test Current	Ambient	Heater	Difference	Stable Difference					
16:23:00	1	0.09	26.00	27.30	1.30	1.30	0.09		11.11	2.8%	14.44
16:28:00	2	0.18	25.90	29.30	3.40	3.40	0.36	0:05:00	11.11	2.8%	9.44
16:39:00	3	0.28	26.90	33.00	6.10	6.10	0.84	0:11:00	10.71	-0.9%	7.26
16:51:00	4	0.37	25.70	38.10	12.40	12.40	1.48	0:12:00	10.81	0.0%	8.38
17:08:00	5	0.47	25.80	44.80	**19.00**	**19.00**	**2.35**	0:17:00	10.64	-1.6%	8.09
17:12:00	6	0.56	25.80	49.70	**23.90**	**23.90**	**3.36**	0:04:00	10.71	-0.9%	7.11
17:21:00	7	0.65	26.10	55.40	29.30	29.30	4.55	0:09:00	10.77	-0.4%	6.44
17:27:00	8	0.75	26.10	62.20	36.10	36.10	6.00	0:06:00	10.67	-1.4%	6.02
17:38:00	9	0.84	25.80	71.30	45.50	45.50	7.56	0:11:00	10.71	-0.9%	6.02
17:45:00	10	0.93	26.30	78.40	52.10	52.10	9.30	0:07:00	10.75	-0.6%	5.60
17:50:00	11	1.02	26.20	83.60	57.40	57.40	11.22	0:05:00	10.78	-0.3%	5.12
17:55:00	12	1.11	26.20	92.00	65.80	65.80	13.32	0:05:00	10.81	0.0%	4.94
18:35:00	13	1.20	25.10	96.80	71.70	71.70	15.60	0:40:00	10.83	0.2%	4.60
18:41:00	14	1.29	25.20	108.70	83.50	83.50	18.06	0:06:00	10.85	0.4%	4.62
18:48:00	15	1.38	24.80	118.00	93.20	93.20	20.70	0:07:00	10.87	0.5%	4.50
18:52:00	16	1.48	24.80	130.20	105.40	105.40	23.68	0:04:00	10.81	0.0%	4.45
19:03:00	18	1.67	25.10	151.00	125.90	125.90	30.06	0:11:00	10.78	-0.3%	4.19
19:15:00	19	1.75	24.40	159.30	134.90	134.90	33.25	0:12:00	10.86	0.4%	4.06
19:22:00	20	1.85	24.80	170.01	145.21	145.21	37.00	0:07:00	10.81	0.0%	3.92
19:29:00	21	1.94	24.50	180.01	155.51	155.51	40.74	0:07:00	10.82	0.1%	3.82
19:35:00	22	2.03	24.50	193.14	168.64	168.64	44.66	0:06:00	10.84	0.2%	3.78