Today’s Power Supplies: How to Select & Get the Most From Your $’s

- More than a Battery with a Knob

Greg Schuster
Power Products Specialist
Agilent Technologies
Agenda

• **Power Supplies Categories**
• **How People Use Power Supplies**
• **Power Supply Characteristics**
  – Output topologies, noise, modes, and characteristics
  – Remote sense and measurements
  – Control via computer and/or analog inputs
  – Packaging and combining outputs
  – Safety
• **Unique Features and Capabilities**
  – Down programming
  – Sequencing of multiple outputs
  – Power arbitrary waveforms
• **Agilent’s offering**
• **Summary**
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Power Supply Categories

Basic Supplies
- Manual or programmable
- Used for setting bias, powering circuits, etc.

Performance Supplies
- Faster, more accurate, higher power
- Typically used in system applications

Modular Supplies
- Compact, flexible, mix-and-match
- Easily interconnected

Specialty Supplies
- Battery simulation
- Solar array simulation

Open Frame Supplies
### What do people do with power supplies?

<table>
<thead>
<tr>
<th>Task</th>
<th>Meaning</th>
<th>Power Supply Required</th>
</tr>
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<tbody>
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</tr>
<tr>
<td><strong>Burn-in</strong></td>
<td>• Lots of power or lots of channels</td>
<td>Basic PS</td>
</tr>
</tbody>
</table>
| **Margin Testing**            | • Test DUT at a variety of points in DUT operating range 
• Speed can be important if high throughput is required or if DUT is being tested at a lot of different points | Basic PS or Performance PS                                                            |
| **Turn-on and Inrush Testing** | • Multiple outputs must be sequenced 
• Measure how much current is drawn when DC bias is first applied | Performance PS                                                                         |
| **Characterization using Waveforms** | • Stimulate the DUT with a time varying voltage to test under dynamic test conditions 
• Speed matters | Performance PS                                                                         |
| **Parametric Testing of Devices** | • Characterize performance of transistors, diodes, resistors and capacitors | Precision Source Measure Unit Device/Parameter Analyzer                                |
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DC Power Supply Topologies

**Linear or series-pass**

- ![Diagram of linear or series-pass topology]

### Applications
- Bench & laboratory
- Automated test
- Low power: ≤ 500 W

### Advantages
- Low output ripple & noise
- Fast programming speed
- Fast transient recovery

### Disadvantages
- Low efficiency
- High weight/watt
- Physically large

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Note: Agilent's linear power supplies classically have fast programming speed which make them a good fit in test systems.
DC Power Supply Topologies

Switched mode (SMPS)

Applications
- Subassembly test
- Burn-in
- Bench & laboratory
- Electromechanical test

Advantages
- High power in small package
- High efficiency

Disadvantages
- Moderate to high** ripple & noise
- Moderate programming speed
- Moderate transient recovery

**Note: Agilent's newest switching power supplies have noise, slew rate, programming speed, and transient performance nearly that of linear supplies.
A linear supply is not always better than a switching supply. Agilent’s high performance switching power supplies have lower noise than many linear power supplies on the market.
TIP: Eliminating Sources of Noise

Start with a low noise power supply

- It is easier to eliminate noise at the source than to filter it out later

Use good connection practice to avoid pickup

- Eliminate loops; twist and shield connections from power supply to DUT
- Carefully route power lines from ac mains to supply
- Think through grounding connections; favor a single point ground
- Ground cable shields at one end only; otherwise, ground loops result as shown below

Do not ground shields at both ends!!
DC Power Supply Output Modes

Constant voltage (CV) mode
- Local sensing
- Remote sensing

Constant current (CC) mode
Output Characteristics

Rectangular

Dual-range

Autoranging
Power Supply Transient Response Example

Transient response spec definition 3 parts
- **Magnitude of the load change**: e.g. 50% of full load to 100% of full load
- **Voltage settling band**: how close the voltage level will settle to its original level before the load change
- **Response time**: it takes the power supplies voltage level to settle within the voltage settling band

Example using sharp 500 mA current pulse
- High Performance DC source volt drop (top): 117 mV
- Basic DC source volt drop (bottom): 176 mV

Example of transient response spec for N6751A
- **Magnitude of load change**: 60% to 100% and from 100% to 60% of full load
- **Voltage settling band**: ±75 mV
- **Time**: < 100 μs
Remote Sense

Local sensing
Lead resistance can cause a significant voltage drop between the output of the supply and the load.

Remote sensing
The sense leads measure the voltage at the load and adjust the power supply output to compensate for voltage drops in the leads.
Remote Sense Best Practice: Minimize Wiring Path Impedance

Four steps to minimize path impedance:

- Use larger size (lower gauge), twisted pair wire
- Reduce distance between power supply and DUT
- Minimize the use of relays and connectors
- Select relays and connectors to minimize contact resistance; consider initial and end of life specs

Beware of transient response issues for dynamic loads

- Use an adequate bypass capacitor at the DUT
- Consider a supply tailored for remote sensing with pulsed loads
Output Measurements

- Many power supplies have a built-in voltmeter and ammeter to measure their own output.
- The measurements can be displayed on the front panel or queried by a computer connected to the interface.
- These measurements are particularly useful in computer controlled systems.
- Measurement (or readback) accuracy is specified as a percent of reading plus an offset.
Controlling the Power Supply

Computer interfaces

- Many DC power supplies have both manual and computer control
- Hardware interfaces can include GPIB, USB, and LAN (LXI-C)

Analog voltage control signal

- Some power supplies provide an analog voltage control input
- The power supply acts as a voltage amplifier providing current up to its rated maximum
- Use the analog control input to:
  - Amplify the power of the input signal
  - Track an analog voltage
Physical Characteristics

Physical size / form factor

• Half rack width or full rack width; some vendors offer ¼ rack width
• Height ranges from 1U to 4U (1.75 inches to 7.00 inches)
• Half rack width is generally better for bench applications
• Full rack width works well in system racks

Front or rear output terminals

• System and high current power supplies have their outputs located on the rear panel
• Bench and some low current power supplies have their outputs on the front

Number of outputs

• Multiple output power supplies can save space on the bench or in a rack
Combining Supplies

Connect power supplies in series for higher voltages

Connect power supplies in parallel for higher currents
Parallel and Series Safety Precautions

**SERIES CONNECTION**

- Never exceed the floating voltage rating of any of the supplies.
- Never subject any of the power supplies to negative voltages.
- Program each power supply independently. If two supplies are used, program each one for 50% of the total output voltage. If three supplies are used, program each supply for about 33% of the total output voltage. Set the current limit of each supply to the maximum that the load can safely handle.

**PARALLEL CONNECTION**

- One unit must operate in constant voltage (CV) mode and the other(s) in constant current (CC) mode.
- The output load must draw enough current to keep the CC unit(s) in CC mode.
- Program the current limit of each unit to its maximum value and program the output voltage of the CV unit to a value slightly lower than the CC unit(s). The CC units supply the maximum output current that they have been set to and drop their output voltage until it matches the voltage of the CV unit, which supplies only enough current to fulfill the total load demand.
Safety Features

Protecting the device under test
- Over Voltage Protection (OVP)
- Over Current Protection (OCP)
- Discrete Fault Indicator (DFI) / Remote Inhibit (RI)
- Watchdog Timer

Protecting the power supply
- Over Temperature Protection (OTP)

Protecting both
- Output disconnect relay
  - May include output polarity reversal
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Unique Feature: Down Programming

- Capacitors discharge slowly under light loads
  - Static voltage source: no problem
  - Varying voltage levels: slow tests

- Down programming
  - Rapidly reduce the output voltage
  - Shorten discharge times by hundreds of milliseconds
Unique Feature: Arbitrary Waveforms/List Mode

- Advanced feature available in Agilent N6700 and 66000 only*
- LIST mode allows power supply to output a waveform like an Arbitrary Waveform Generator (ARB)
  - Slower than an ARB, but MUCH more power than an ARB
- For each point, you program a V, I, and step time
- LIST mode can change the output faster than a PC can send commands
- Example: LIST mode rapidly steps through test conditions for fast throughput

* Also available in specialized products: AC Source, DC Loads
Unique Feature: Sequencing

- Precise synchronization of bias voltage turn on and off
- Improper turn-on or -off may cause damage to DUT
- Modular power supplies often have built-in sequencing capabilities

Example applications:
- LCD testing
- PC motherboard
Wireless Device Power Measurement Challenges

Measure Battery Capacity, Energy & Run-Down Characteristics

Validate & Optimize Battery Charge Management

Capture and Simulate Power Interruptions & Anomalies/Transients

Measure Dynamic Current Drains

Analyze and Optimize Current Drain & Impact of Design Changes on Battery Life

Validation of Device Specifications and Design Margins
Measurement System Requirements

Properly source DUT Power
Log battery rundown voltage
Accurately measure dynamic voltage and current data
On/off Sequencing and slew rate control of power supply outputs
Device emulation – battery, charger, load
Long Duration Data Logging
Provide High Level Summary of Results
Data Analysis
The N6705 DC Power Analyzer
Boosts the productivity of the R&D Engineer

Integrates multiple instrument functions into a single box

- 1 to 4 advanced power supplies
- Digital voltmeter and ammeter
- Arbitrary waveform generator
- Oscilloscope
- Datalogger
- All functions and measurements are available from the front panel

Gain insights into your DUT's power consumption — in minutes, not hours — without writing a single line of code!
DC Power Analyzer has sourcing and measurement capability

Sourcing functions

• Simple DC bias
• Arbitrary waveform generator-like functions
• Sequencing outputs

Measurement functions

• DC measurements
• Oscilloscope-like functions
• Datalogger function
What can a DC Power Analyzer help you do?

- Setup and view critical turn-on/turn-off sequences
- Control DC bias supply ramp-up/down rates
- Measure and display voltage vs time and current vs time to visualize power into the DUT
- Measure startup or inrush current
- Measure peak power requirements
- Generate DC bias supply transients and disturbances to see how the DUT responds
- Log data for seconds, minutes, hours, or even days to see current consumption or capture anomalies
99% of the time is sleep; 7.46 µA average (7.54 µA * 99%)
1% of the time is transmit; 86 µA average (8.6 mA * 1%)
12,900 Hrs (1.5 yrs) with 1.2A-Hr battery (93.5 µA total drain)

Wireless Temperature-Humidity Sensor
• 38 sec-long, 7.54 µA sleep periods

Dual Transmit Burst
• 1-temp, 1-humidity
• 0.19 sec-long each
• 8.6 mA average during burst

Transmit Burst Pulses
• 14.4 mA pulse plateau
• 2.01 mA idle current
Agilent N6705 Sourcing Capabilities

**Output waveforms**

- DC bias
- Step turn-on
- Ramp turn-on
- V dropout
- Staircase turn-on
- Exponential turn-on
- V pulse
- Trapezoid

**Output sequencing**

- Module 1
- Module 2 (Delay 2)
- Module 3 (Delay 3)
- Module 4 (Delay 4, Slew)
- OUTPUT ON

Anticipate — Accelerate — Achieve
Flexible: Mix and Match Modules

N6700B Low-Profile MPS Mainframe, 400 W
N6701A Low-Profile MPS Mainframe, 600 W
N6702A Low-Profile MPS Mainframe, 1200 W
  • Holds up to 4 modules, below, in any combination

50 W DC Power Modules (6 models up to 100 V or 10 A)
100 W DC Power Modules (6 models up to 100 V or 20 A)
300 W DC Power Modules (5 modules up to 150 V or 15 A)
  • For basic DUT or fixture power

High-Performance, Autoranging DC Power Modules
50, 100, 300, and 500 W (6 models up to 60 V or 50 A)
  • For ATE systems where power supply plays key role as source and measurement instrument

Precision DC Power Modules
50, 100, 300, and 500 W (6 models up to 60 V or 50 A)
  • For semiconductor testing and applications requiring precision in the mA & µA region

Source/Measure Units (SMU) & Application-Specific Modules
20 W (3 SMUs up to ±20 V or ±3 A; 2 app-specific up to 8 V, ±3 A)
  • SMUs for high-precision sourcing & measurement applications, such as battery drain analysis; application-specific modules for battery-powered device manufacturing
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## Determining the right power supply for the job

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*Depends on required speed or on required accuracy of V setting*
Agilent N5700 and N8700
System DC Power Supplies

High power density
• Up to 1560 W in 1U or up to 5200 W in 2U
• Leaves room for other critical instruments in a test system
• Affordable Basic Power

Simplify Test System Development
• GPIB, USB, and LAN (LXI C) standard on all models
• Built in V & I measurements
• Flexible AC input voltage options – run in any environment
• Full DUT protection: OV, OC, UVL
• Parallel up to 4 units for higher power
# N5700 and N8700 System DC Power Supplies

## Key Applications
- Basic DC Bias
- Burn-in
- Margin Testing

## 45 models with stable, single-output power, up to 1.5 kW in 1U or 5 kW in 2U

<table>
<thead>
<tr>
<th>Models</th>
<th>#</th>
<th>$</th>
<th>Power</th>
<th>Max V</th>
<th>Max I</th>
</tr>
</thead>
<tbody>
<tr>
<td>N5741A thru N5752A</td>
<td>12</td>
<td>$2500</td>
<td>750 W</td>
<td>600 V @ 1.25 A</td>
<td>90 A @ 8 V</td>
</tr>
<tr>
<td>N5761A thru N5772A</td>
<td>12</td>
<td>$2959</td>
<td>1500 W</td>
<td>600 V @ 2.5 A</td>
<td>180 A @ 8 V</td>
</tr>
<tr>
<td>N8731A thru N8742A</td>
<td>12</td>
<td>$4700</td>
<td>3300 W</td>
<td>600 V @ 5 A</td>
<td>400 A @ 8 V</td>
</tr>
<tr>
<td>N8754A thru N8762A</td>
<td>9</td>
<td>$6100</td>
<td>5000 W</td>
<td>600 V @ 8 A</td>
<td>250 A @ 20 V</td>
</tr>
</tbody>
</table>
Agilent N6700 Modular Power System

**Small**
- Size of a switching supply (1U) with the performance of a linear
- Choice of 3 mainframes in 1U: 400 W, 600 W, and 1200 W
- Up to 4 outputs in 1U at up to 300 W per output
- Parallel for more power

**Flexible**
- Select any combination of 34 different DC power modules, from basic to precision to (more modules to come)
- GPIB, USB, and LAN (LXI C) standard

**Fast**
- Command processing time of < 1 ms for max system throughput
- Built-in output sequencing for difficult power turn-on applications
- Built-in scope-like digitizer
# Agilent N6700 Modular Power System

## Key Applications for ATE
- Output Sequencing
- Margin Testing
- Characterization using waveforms

## Small, flexible, and fast multiple-output power supply for ATE

<table>
<thead>
<tr>
<th>Mainframe Model</th>
<th># of DC Power Modules</th>
<th>Maximum Power</th>
<th>$ for the mainframe only</th>
</tr>
</thead>
<tbody>
<tr>
<td>N6700B</td>
<td>Up to 4</td>
<td>400 W</td>
<td>$2500</td>
</tr>
<tr>
<td>N6701A</td>
<td>Up to 4</td>
<td>600 W</td>
<td>$2800</td>
</tr>
<tr>
<td>N6702A</td>
<td>Up to 4</td>
<td>1200 W</td>
<td>$3650</td>
</tr>
</tbody>
</table>

**Additional Information:**
- N6700B Low-Profile MPS Mainframe
- N6700 DC Power Modules
Agilent’s Power Products Offering: 200+ solutions

- High Performance 1U Modular Power System
- AC Power Supplies
- High Power Basic ATE DC Power Supplies
- Bench Power Supplies
- High Performance System DC Power Supplies
- Power Supplies for Battery Powered Devices
- N6705B DC Power Analyzer
- DC Electronic Loads
- N5700 1U Single Output Supply

Agilent Technologies
Summary

Today’s power supplies

- Are used in many different applications
- Offer a variety of features to address specific needs

Agilent’s power supply offering

- Includes a wide range of power products
- Has the right product to meet your needs

Today’s power supplies certainly are..... more than a battery with a knob!
Agilent’s power page:
www.agilent.com/find/power

Agilent’s “Watt’s Up” power blog:
http://powersupplyblog.tm.agilent.com
For Additional Information, please contact:
Greg Schuster
Agilent Technologies
Power Products Specialist

greg_schuster@non.agilent.com  630-561-3993

Any questions?

THANK YOU!
# The Agilent N6705B DC Power Analyzer

## Key Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of outputs:</strong></td>
<td>Takes 1 to 4 DC Power Modules</td>
</tr>
<tr>
<td><strong>Total output power:</strong></td>
<td>600 W (= sum of 4 outputs)</td>
</tr>
<tr>
<td><strong>Max current per output:</strong></td>
<td>20 A (through binding posts) or 50 A (circumvent binding posts)</td>
</tr>
<tr>
<td><strong>Max voltage per output:</strong></td>
<td>150 V; can put in series for higher V</td>
</tr>
<tr>
<td><strong>Available power per output:</strong></td>
<td>20 W, 50 W, 100 W, 300 W, 500 W</td>
</tr>
<tr>
<td><strong>Ammeter accuracy:</strong></td>
<td>Up to 0.025 % + 8 nA (SMU)</td>
</tr>
<tr>
<td></td>
<td>Up to 0.5 % + 100 nA (Precision module with 2UA option)</td>
</tr>
<tr>
<td></td>
<td>Up to 0.10 % + 4 mA (Hi-Performance module)</td>
</tr>
<tr>
<td><strong>Scope:</strong></td>
<td>Up to 200 kHz digitizer, 512kpts, 18 bits</td>
</tr>
<tr>
<td><strong>Arb bandwidth:</strong></td>
<td>Up to 100 kHz (SMU), 4.5 kHz (Precision), 260 Hz (Basic)</td>
</tr>
<tr>
<td><strong>Data Logger sample interval:</strong></td>
<td>20 µs minimum, 1 minute maximum</td>
</tr>
<tr>
<td><strong>Data Logger maximum log size:</strong></td>
<td>500 Million readings (~2 GB)</td>
</tr>
<tr>
<td><strong>Internal non-volatile memory:</strong></td>
<td>4 GB</td>
</tr>
</tbody>
</table>
GPETE Blog (just search gpete)

General Purpose Electronic Test Equipment (GPETE)

Here you will find hints & tips, industry trends, and new product announcements all pertaining to the top five most commonly used test & measurement products: DMMs, Function / Arbitrary Waveform Generators, Counters, Oscilloscopes, and Power Supplies. They can be summed up as GPETE since they are used in just about every industry and application space. Have a question or topic suggestion related to GPETE? Just enter it in as a comment or email me: neil_forciar@agilent.com

Home  FG/AWG  Counters  DMMs  Scopes  Solar  Power  Software  Modular

Tuesday, July 24, 2012

Free Program for Analyzing Clocks and Oscillators

In this blog post we will look at a free MATLAB program that I created and posted on MATLAB Central for download. The program is called Stability Analyzer 53330A and it provides stability analysis capabilities of clock and oscillator measurements, including Allan and Hadamard Deviation calculations. The “new” program is actually an update to a previous version of Stability Analyzer 53330A that was created over a year ago, but the new version has much more capability. The following is a summary of the program and its capabilities.

Description:
The Stability Analyzer 53330A (2.0) is a free MATLAB program that allows you to analyze the stability of clocks, oscillators, and other signal sources using frequency measurements. The program either inputs / uploads frequency measurements from Agilent’s 53230A universal counter or stored measurements on a CSV file. The program provides the user with a choice of two stability calculations, Allan deviation or Hadamard deviation (both overlapping). The program outputs three plots:

- Allan or Hadamard deviation plot with optional confidence intervals
- Frequency vs time plot of all measurements
- Histogram frequency plot

All plots provide zoom and pan capabilities as well as the ability to identify a particular plot point. The program is setup and run

Thank You!
## Agilent Basic DC Power Supply Family

### Non-programmable (for Labs and Low-cost Manufacturing)

<table>
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<tr>
<th>Model</th>
<th>Power Range</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>U8000A</td>
<td>90 W, 150 W</td>
<td>$300</td>
</tr>
<tr>
<td>E3610A-17A</td>
<td>30 W - 60 W</td>
<td></td>
</tr>
<tr>
<td>E3620A</td>
<td>50 W</td>
<td></td>
</tr>
<tr>
<td>E3630A</td>
<td>35 W</td>
<td></td>
</tr>
<tr>
<td>U8030A</td>
<td>375 W</td>
<td>$995</td>
</tr>
</tbody>
</table>

- Single output: 13 models
- Multiple Output: $995

### Programmable (All have GPIB -- some include RS-232 or USB + LAN/LXI)

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<th>Model</th>
<th>Power Range</th>
<th>Price</th>
<th>Models</th>
</tr>
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<tbody>
<tr>
<td>E3640A-45A</td>
<td>30 W - 80 W</td>
<td>$700</td>
<td>58</td>
</tr>
<tr>
<td>E3646A-49A</td>
<td>60 W - 100 W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E3631A</td>
<td>80 W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E3632A-34A</td>
<td>120 W - 200 W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N5700/N8700</td>
<td>750 W – 5000 W</td>
<td>$6,500</td>
<td></td>
</tr>
</tbody>
</table>

- Single output: 58 models
- Dual Output: 58 models
- Triple Output: 58 models
Agilent Performance DC Power Supply Family

N6700 Low-Profile Modular Power System
- $8000
- $3000

N6705 DC Power Analyzer
- $28,000
- $25,000

66000 Modular Power System
- $6000
- $20,000
- 8 x 150 W, for legacy systems

Single Output DC, GPIB, Ideal for ATE, Accurate, Low Noise
- 33 models
- $2000
- $9000

Models:
- 6610 50 W
- 6630 100 W, 2Q
- 6640 200 W
- 6650 500 W
- 6670 2000 W
- 6680 5000 W
- 6690 6600 W

Prices:
- $2000
- $3300
- $6000
- $9000
- $25000
- $28000

Note: The text includes financial information and product specifications for various power supplies and analyzers, highlighting their use cases and features.
Constant Voltage Example

- Assume we have a power supply capable of 10 V, 10 A maximum
- Set V limit to 5 V; I limit to 7 A
- Assume 1 ohm load
- PS will source 5 V; resulting current will be 5 A
- Since current drawn is less than the current limit setting, PS operates in CV mode
- Load line intersects V set line determining output current

\[ R_L = \frac{V_{out}}{I_{out}} \]

\[ I_{sourced} < I_{limit} \]
Constant Current Example

- Same PS: 10 V, 10 A max
- Set V limit to 5 V, change I limit to 4 A
- Assume 1 ohm load
- PS will try to source 5 V, but that would require 5 A of current to flow
- Since current required to support 5 V is greater than the current limit setting, current is limited to the 4 A setting. V must drop; PS operates in CC mode.
- Load line intersects I set line determining output voltage

\[ R_L = \frac{V_{out}}{I_{out}} \]
For multiple bias input subassemblies, if one bias supply senses a failure, a signal is sent to shut down all connected supplies.

- TTL Input/Output
- Fault definition defined by system controller at set-up
Can control output sequencing between modules with 100 ns resolution

Can control slew rate from 1 ms to 10 seconds for 0 to max V transition

Useful for powering up devices, PC boards, or subassemblies that require control of multiple bias supplies during startup

Can also set the output off sequence independently

Extendable across mainframes for > 4 outputs
Example of High Speed Margin Test:
Automotive Engine Control Unit
Application Example for N5700:
Satellite Test

Customer A needed to replace the test systems it used to power halogen heaters for environmental tests on satellites.

The customer built side-by-side test systems to compare the Agilent N5750A DC system power supply (150 V, 5 A) with a competitive power supply.

The N5750A outperformed the competitive supply by a wide margin; in fact using the N5750A, this customer was able to reduce its system size by 66% and dramatically reduce power consumption and the heat generated by power supply operation.
Application Example for N5700: Base Station Power Amplifiers

Customer Situation
- Designs and manufactures base station power amplifiers
- Functional test system requires multiple PS to source 48 V, 15 A and 24 V, 25 A with built-in measurement and DUT protection
- Using the Agilent 6032A (60 V, 50 A, 1000 W, 3U) needs to reduce size and cost of rack

Why did the customer choose the N5700?
- The N5700 is small in size – 1500 W in a 1U
- Easy to switch - N5700 has built-in 603xA programming compatibility
- It is an affordable solution with good output range (N5767A: 60 V, 25 A) and good protection capabilities

Summary
- Customers saves money, rack space, and time to integrate the newer N5700 power supply
Application / Success Story for N6700

Customer B has a system with 105 x N6700B mainframes filled with 420 x N6733B modules for thermal testing of chips

Getting here was a test system evolution…

- The previous 2 tests systems had other non Agilent power supplies (a lot, but not 420) driven by external voltage or resistance programming, or power supplies from other vendors
- The customer added one N6700B mainframe to one of the older systems and that’s what introduced him to the product family, eventually leading to the large system

System is used to do thermal testing on chips