

Keysight Technologies

Using 6690A Series System DC Power Supplies for Automobile Battery Simulation

Application Note



Minimize your testing downtime with this reliable, high power DC supply

- Low ripple & noise
- Fast up-and-down programming
- High accuracy current programming and read back
- Industry standard SCPI programming commands
- Analog programming
- Analog monitoring
- Full protection from overcurrent, overvoltage, overtemperature
- Remote sense
- Electronic calibration
- Standard 3-year warranty

In the past few years, the electronic content of automobiles has been increasing at a fast rate, resulting in higher battery currents. Combine that with efforts to improve efficiency; today's 12 V car battery is just not adequate for the cars of the future. The trend is for higher voltage, which will lower the current, resulting in savings in the wiring harness and other components used in cars.

The standard voltage for a car battery is becoming 42 V. However, because of load changes during the operation of the vehicle, that voltage may reach up to 60 V or go as low as 25 V. The new 42 V battery will have different requirements for duty cycle and total power capability than the 12 V battery. Under the start/stop scenario of the future vehicles, the number of starts and stops that the battery will endure could increase by a factor of more than 10. This loading puts more strain on the battery and other components used in the car. The Keysight Technologies, Inc. 6692A power supply is ideal for simulating the battery under all loading conditions. This power supply can also be used to test electronic equipment while simulating actual battery voltage fluctuations.

During the developmental phase, Keysight power supplies undergo a battery of environmental tests such as an 8-day temperature profile. Other tests include humidity, altitude, shock and vibration, ESD, ac line tests, EMC and RFI. The power supplies are designed with built-in margin so that they can meet their specifications over time, under all conditions, and also withstand peak stress.

Wide design margins and stringent environmental tests translate into reliable products. To you, it means lower cost of ownership, minimum downtime and faster delivery of your electronic equipment/components to your customers.

Specifications	Keysight Model Number			
	6690A	6691A	6692A	
Output Ratings				
Voltage:	0 - 15 V	0 - 30 V	0 - 60 V	
Current: (Derated linearly 1%/°C from 40°C to 55°C)	0 - 440 A	0 - 220 A	0 - 110 A	
Programming Accuracy (@25 ±5°C)				
Voltage:	0.04% +	15 mV	30 mV	60 mV
Current:	0.1% +	230 mA	125 mA	65 mA
Ripple & Noise (from 20 Hz to 20 MHz with outputs ungrounded, or with either output terminal grounded)				
Constant Voltage:	rms	2.5 mV	2.5 mV	2.5 mV
Constant Voltage:	p-p	15 mV	25 mV	25 mV
Constant Current: (With load inductance >5µH)	rms	200 mA	50 mA	30 mA
Readback Accuracy (from front panel or over GPIB with respect to actual output @ 25 ±5°C)				
Voltage:	0.05% +	22.5 mV	45 mV	90 mV
±Current:	0.1% +	300 mA	165 mA	80 mA
Load Regulation (change in output voltage or current for any load change within ratings)				
Voltage:	0.002% +	650 µV	1.1 mV	2.2 mV
Current:	0.005% +	40 mA	17 mA	9 mA
Line Regulation (change in output voltage or current for any line change within ratings)				
Voltage:	0.002% +	650 µV	650 µV	650 µV
Current:	0.005% +	40 mA	17 mA	9 mA
Transient Response Time (for the output voltage to recover to within 150 mV following any step change from 100% to 50% or 50% to 100% of the rated output current):				
		<900 µs		

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

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