YOKOGAWA

Battery Simulator 7655

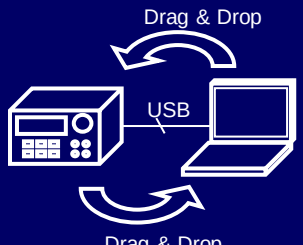
Reproducing the internal resistance change based on the I-V characteristics of batteries

Characteristic measurements and simulation of output functions all in one unit

- Generation/measurement range is up to 12 V, 3.2 A max
- 1 ms fastest update period
- Automatic measurements of the I-V characteristics and simulation of output functions are all in one unit
- Accurately reproduces non-linear internal resistance change
- No need to prepare a number of battery samples that are low battery conditions or defective

Usage

- Battery simulation of portable devices such as mobile phones, digital cameras, and so on
- Operating marginal tests for low batteries and for defective batteries
- Battery drive tests of power circuits
- Simulation of battery cells when designing the battery pack protective circuit
- Measurements of I-V characteristics and charging/discharging characteristics (V-t)



USB STORAGE

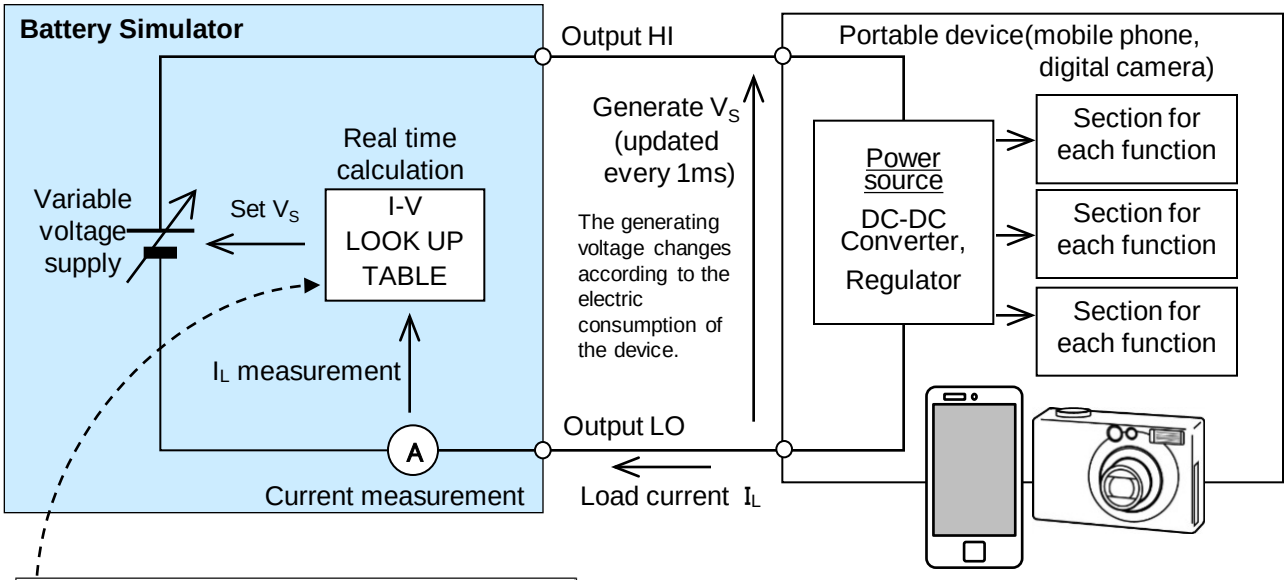
LF 7655BS-01EN

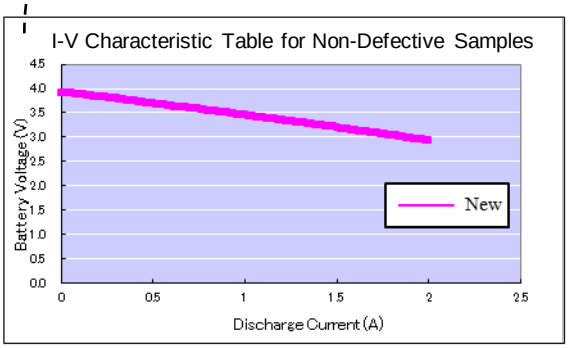
Reproducing a variety of conditions of the batteries

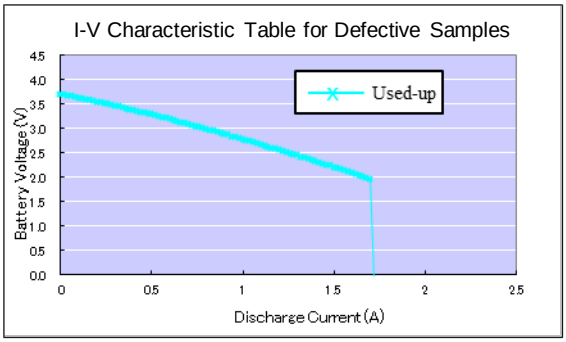
This product is a device that simulates the internal resistance changes of batteries. It measures the current-voltage characteristics when the battery is being charged/discharged and simulates the internal resistance changes of the batteries by controlling the output voltage in real time with reference to this characteristic. It is possible to operate marginal tests of low and defective batteries that drive portable devices such as mobile phones and digital cameras.

■Structure and Operation of the Battery Simulator Function

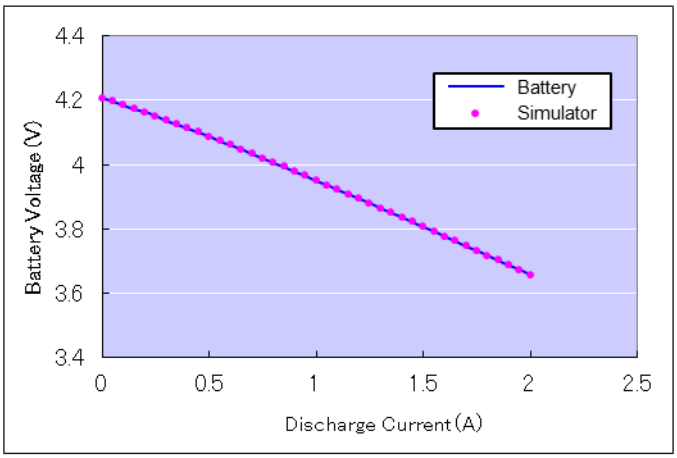
This product consists of variable voltage supply, current measurement, and real time calculation. At first, it automatically measures the electric characteristic data of the battery using the I-V characteristic measurement function and stores the data into the internal memory as a I-V LOOK UP TABLE. When it simulates the batteries, load currents are measured from connected portable devices. It immediately decide the battery voltage Vs from the load current I_L with reference to the TABLE and outputs Vs. The output voltage is repeatedly updated every 1ms.







Comparing I-V Characteristic of Battery Simulation Output and Lithium Ion Batteries



This battery simulator can trace the characteristics of the lithium ion battery completely.

■Characteristic Measurement Function

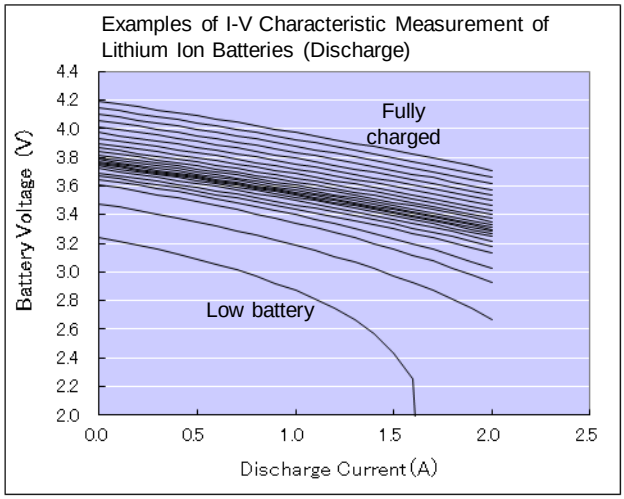
I-V Characteristic Measurement

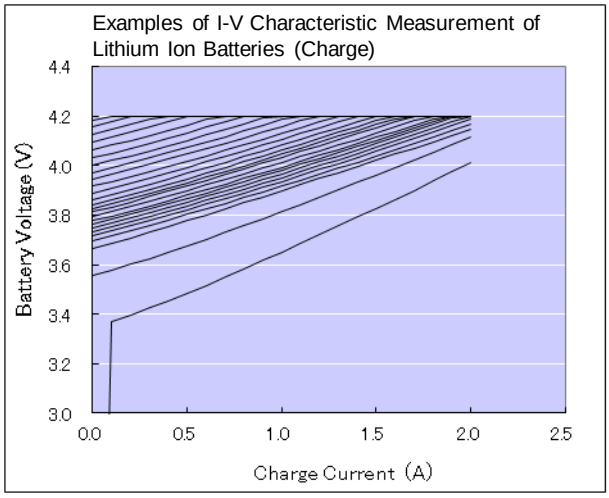
＜Discharge Characteristic Measurement＞

The discharge I-V characteristics are measured with a fully charged battery. The battery simulator gets the I-V characteristic curve by gradually increasing the discharge current and by measuring the battery voltage at each current value. When one characteristic curve measurement is completed, it consumes a certain constant current value from the battery for a while. After stopping the current consumption, it waits for the recovery of the battery voltage and gets the next characteristic curve. These operations are automatically repeated until the measured battery voltage reaches the final voltage. The characteristic curves are stored as CSV files in the internal memory of the battery simulator.

＜Charge Characteristic Measurement＞

The charge I-V characteristics are measured with a discharged battery. The battery simulator gets the I-V characteristic curve by gradually increasing the charge current and by measuring the battery voltage at each current value. As with the discharge characteristics measurement, after charging a certain constant current value to the battery and stopping it, it waits for the recovery of the battery voltage. The upper limit of the battery voltage is restricted by the voltage limiter.





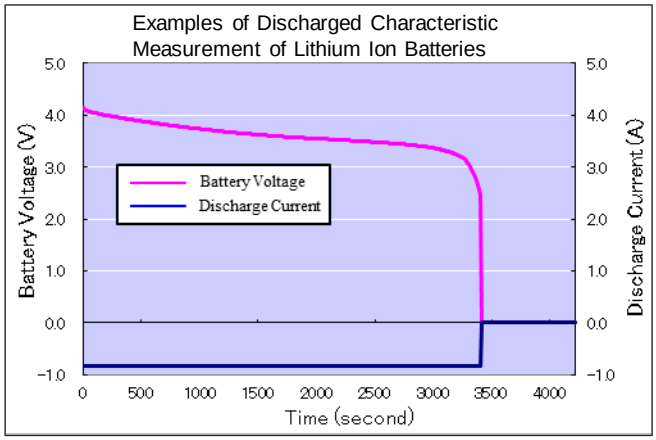
V-t Characteristic Measurement

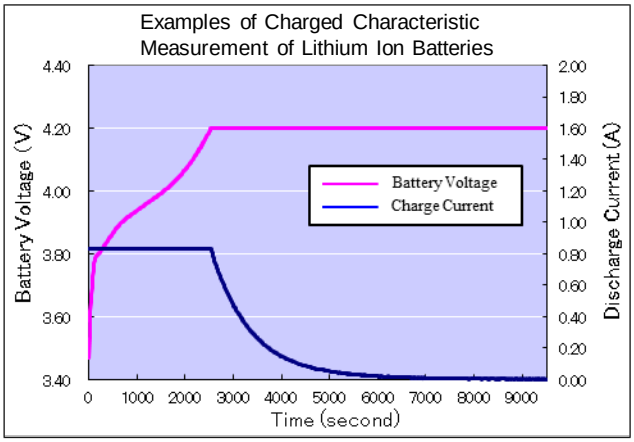
＜Discharge Characteristic Measurement＞

The discharge V-t characteristic is measured with a fully charged battery. The battery simulator discharges the constant current from the battery. It gets the time variation of the battery voltage (V-t curve) by measuring the battery voltage at a certain cycle in discharging. This measurement continues until the battery voltage reaches the final voltage. The characteristic curve is stored as a CSV file in the internal memory of the battery simulator.

＜Charge Characteristic Measurement＞

The charge V-t characteristic is measured with a discharged battery. The battery simulator charges the constant current to the battery. It gets the time variation of the battery voltage (V-t curve) by measuring the battery voltage at a certain cycle in charging. It automatically switches to the constant voltage charge (constant voltage generation)/the current measurement operation when the battery voltage reaches the upper limit. The charge current gradually weakens in the constant voltage charge. It keeps measuring the charge current until the charging is finished (until the current no longer flows). The battery simulator has an auto V/I function that automatically switches from the voltage measurements to the current measurements when the battery voltage reaches the voltage limit.





■Main Specifications ※1

Output of Battery Simulation	Operation mode	Voltage generation, current measurement
	Voltage range	12 V/ 20 V range
	Voltage setting resolution	5.5 digits
	Output voltage accuracy (12 V range)	±(0.02 % of setting + 5 mV)
	Maximum load current	3.2 A(12 V range)/ 2 A(20 V range)
	Output voltage update cycle	Minimum cycle of 1ms
	Current measurement accuracy	±(0.03 % of reading + X) X=400 µA at 200 mA range X=6 mA at 3 A range
Measurement of Battery Characteristics (I-V Curve Tracer)	Operation mode	Current generation, voltage measurement
	Current setting range	-3.2～3.2 A (10 mA resolution)
	Current generation accuracy(3A range)	±(0.03 % of setting + 5 mA)
	Voltage measurement accuracy	±(0.02 % of reading + Y) Y=200 µV at 2 V range Y=1 mV at 20 V range
	Voltage limiter※2	High limiter: 100 mV ～ 20 V Low limiter: -20 V ～ 19.8 V
Other Functions	Constant current charge/discharge	
	Characteristic (battery voltage-time) measurements of charge/discharge	
General Specifications	Dimensions	Approx. 213(W)×132(H)×400(D) mm
	Weight	Approx. 7 kg

*1: This product is the GS610 Source Measure Unit (model name 765501) with the Battery Simulator Function. The specifications are the same as the GS610 except for the Battery Simulator Function. Please refer to our Bulletin 7655-00E. The operators and the user define calculation function that are standard in the GS610 cannot be used in this product.

*2: At the voltage limiter range = 20 V. The high limiter value must be equal or larger than the low limiter value + 200 mV.

■Series Lineup

Model	Descriptions
765501	GS610 Source Measure Unit (Standard Model)
765501/Z *	7655 Battery Simulator

* Please inquire about the delivery date of the "765501/Z" for the special models.

■Price

Please contact our sales staff.

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