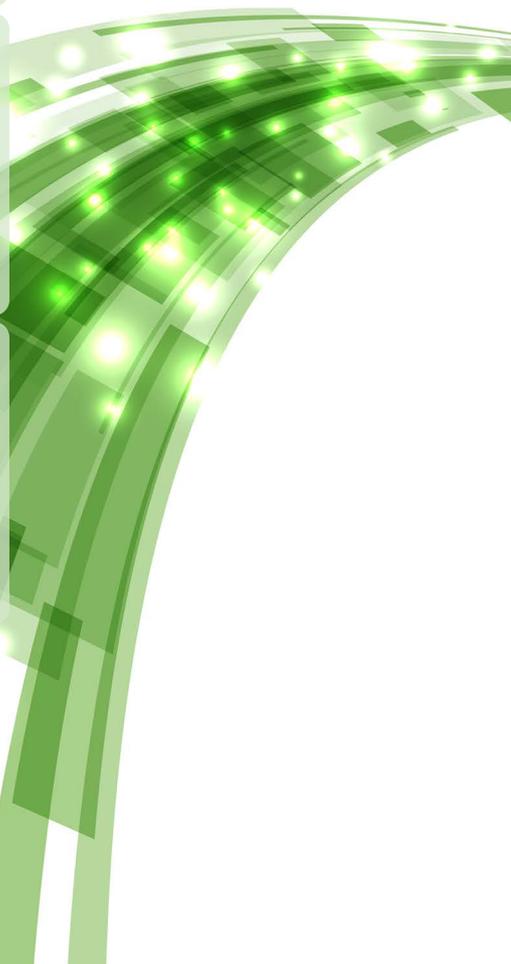


Selection Guide Vol. 1



For Evaluations of Next-Generation Communication Devices

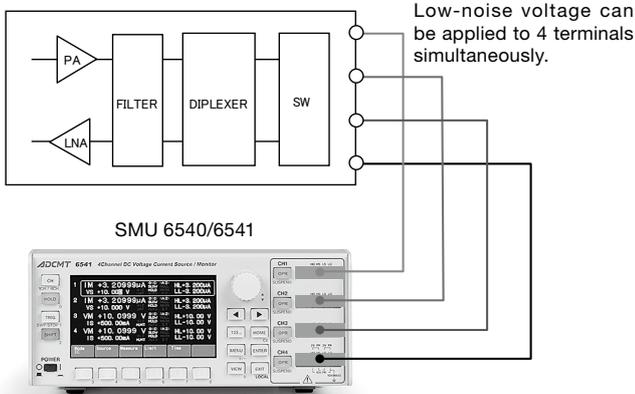
Racing to develop large-capacity high-speed communication technology typified 5G has already begun shifting to a future communication infrastructure beyond 5G. However, there are a lot of issues to be faced such as expansion of wireless communication base stations, development of optical fiber communication apparatus and development of higher-performance batteries necessary for mobile phones. To realize such a high-speed communication, high-performance electronic devices and modules are essential. ADC offers you various types of measuring instruments optimal for evaluating their basic performances.

RF Front End Module Evaluation

The 6540 and 6541 are 4-channel compact DC Voltage Current Source/ Monitors having a low-noise feature (10 V range: 5 mVp-p). As synchronous source and measurement across the channels are available, the 6540 and 6541 are capable of low-noise voltage source, signal application and current measurement with the minimum resolution of 10 pA by a single unit, and are suitable for evaluation of RF front end modules that require controlling multiple terminals at the same time.

(Maximum power per channel: ±10 V / ±500 mA, ±1 A for 4 channels)

RF front end module (FEM)

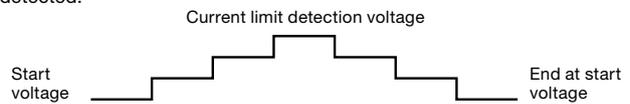


GaN HEMT Breakdown Characteristic Measurement

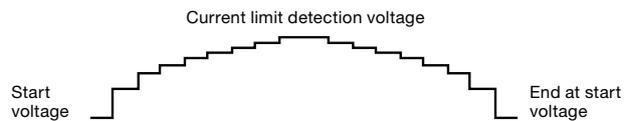
Using the limit reverse (multi slope) function of the sweep measurement in the sequence program No 6 of the 5450/5451 will allow you to measure the breakdown characteristics of GaN HEMTs.



The limit reverse function is a function to make the output voltage in the sweep measurement return to the start voltage when the current limit is detected.



The limit reverse (multi slope) function is a function to vary the step voltage (Vstep) as shown below by comparing the measurement current (IM) and the limit detection current (IL) at every step. Accordingly, the step voltage can be finely changed around the current limit detection point.



Measurement current value	Step voltage
$IM \leq (IL * 10\%)$	Vstep
$(IL * 10\%) < IM \leq (IL * 50\%)$	Vstep / 2
$(IL * 50\%) < IM \leq (IL * 80\%)$	Vstep / 5
$(IL * 80\%) < IM$	Vstep / 10

Evaluation of Receiver Modules with Avalanche Photodiodes

The I-V characteristics of 4-channel receiver optical subassemblies (ROSA) with avalanche photodiodes (APD) can be evaluated by using the 4000 and two units of the 40052. The 40052 can perform VSIM (voltage source current measurement) only with the input TRIAX cable by connecting the output terminal to the GND by the "HIG1" command.

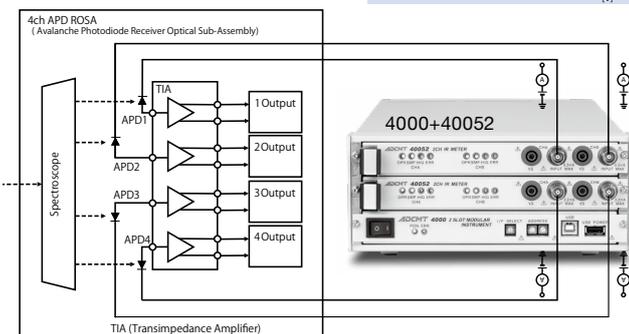
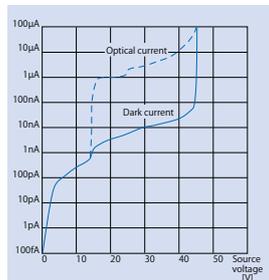
As the voltage source circuit of the 40052 adopts the same system as our SMUs, no overshoot occurs and no stress is given to devices because of the high-speed response constant current system current limiter.

When there is a current limit of 100 μA with the voltage source between 0 V and 200 V, dark current characteristic measurement between 10 fA to 100 μA is available.

Voltage source: 0 to ±200 V
(minimum resolution: 1 mV)

Current measurement: 0 to ±3.2 mA
(minimum resolution: 10 fA)

Current limit: 10 μA to 3.2 mA



Current Consumption Measurement of Digital Devices and Mobile Phones

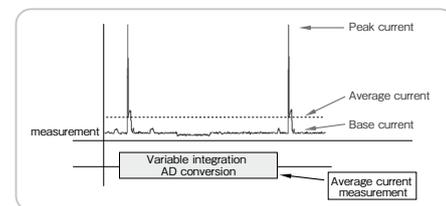
-Variable Integration Time-

Mobile phones in the standby state and IOT sensors make communication at a constant period and operate by momentary pulse current. Thus, to get the current consumption, the average value measurement is essential.

The DC voltage current source monitors 6540, 6541 and 6253, the digital multimeters 7451A, 7461A and 7461P, and the digital electrometer 5350 contain variable integration system-adopted A-D converters, so that they can perform precise average current measurement by adjusting the integration time to the pulse period.



SMU 6540/6541/6253
DMM 7451A/7461A/7461P
Electrometer 5350



For Tests and Evaluations of Energy Control Circuits and Electronic Components

Electronic components and circuits used in CO₂ reduction equipment must be controlled precisely. Typical examples are, high-efficiency DC/DC converters and high-performance batteries. Our DC voltage/current source monitors and digital multimeters offer you optimal evaluation methods with unique functions and excellent performances.

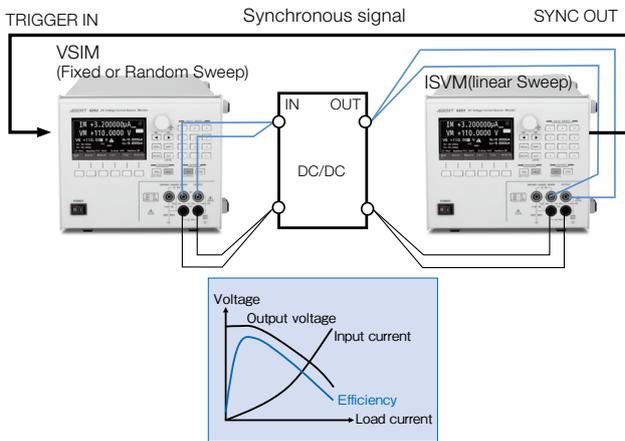
DC/DC Converter Evaluation

The DC/DC converter evaluation is available by using two units of SMUs. One SMU on the input side is set to the VSIM fixed sweep mode. The other SMU on the output side is set to the ISVM linear sweep mode with negative current. Then the input and output characteristics are measured by increasing the load current.

The SYNC OUT signal from the SMU on the output side is connected to the TRIGGER IN input of the SMU on the input side to perform synchronous measurement.

The conversion efficiency is obtained by using the input power on the input side $V_i \cdot I_i$ and the load power on the output side $I_o \cdot V_o$ as follows: $\eta = I_o \cdot V_o / (V_i \cdot I_i)$. The hysteresis characteristic can be also evaluated by setting the linear sweep to the reverse mode.

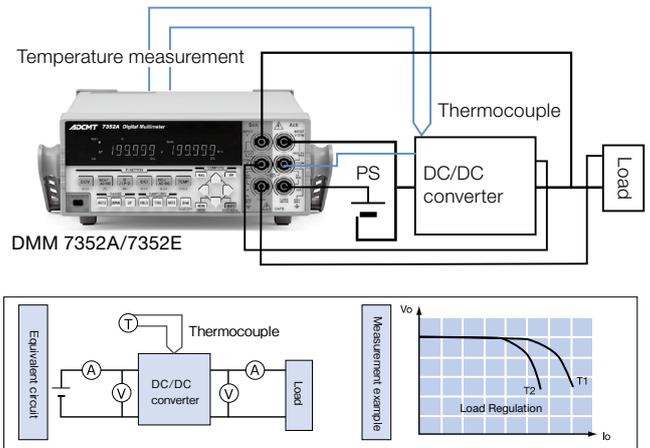
SMU:
6240B/6241A/6242/6243/6244/6247C/6247G/6540/6541/6253
(As for the 6243/6244, use the random sweep mode instead of the fixed sweep mode.)



DC/DC Converter Evaluation

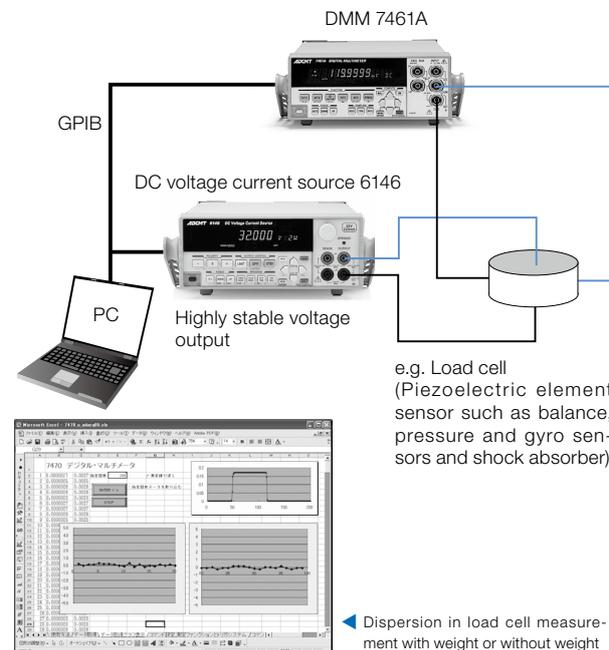
Five types of measurements: input voltage/current on Ach, output voltage/current on Bch and temperature on rear TEMP are available using the 7352A/7352E.

The input and output characteristics, load regulation, conversion efficiency, and rise in temperature of a DC/DC converter can be evaluated by a single unit.



Highly Stable Measurement of Sensor Output

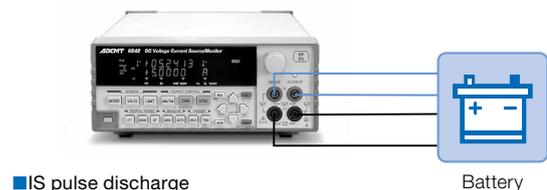
The high-accuracy digital multimeter 7461A with 6½-digit display resolution is suitable for inspections or quality control of various precision sensors. When a highly stable power supply is required such as for load cells, the DC voltage current source 6146 is applicable.



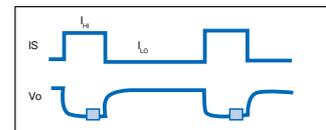
Mobile Phone Battery Evaluation

Our DC voltage current source monitors are capable of charge/discharge test by bipolar output by a single unit. In current sink operation, battery capacity evaluation is available. As for pulse discharge, the minimum pulse width of 25 ms and the setting resolution of 1ms can be set, allowing the evaluation of mobile phone batteries (6253).

DC voltage current source
6241A/6242/6240B/6243/6253/6244/6247C/6247G

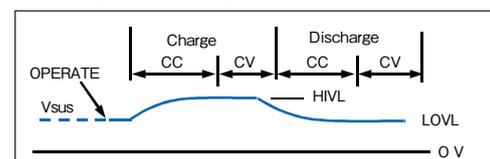


IS pulse discharge



Charge/discharge

Over charge and discharge protection by HIVL and LOVL settings



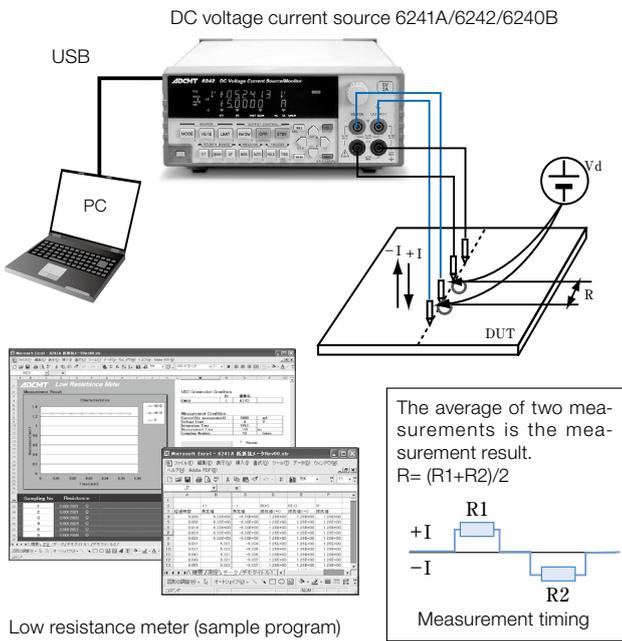
For Test and Evaluations of Electronic Materials Used in Energy Saving Equipment

CO₂ reduction materials have various characteristics. Fully measuring these characteristic leads to stable development of products. To conduct insulation test or static electricity test of various materials including sheet, liquid, block and power, ADC offers high-performance digital electrometers and sample boxes that fit various samples.

Conductive Plastic and Connector Low Resistance Measurement

The 6241A/6242/6240B can measure the contact resistance of conductive plastics or connectors easily with a resolution of open-circuit voltage 10 μV as shown below.

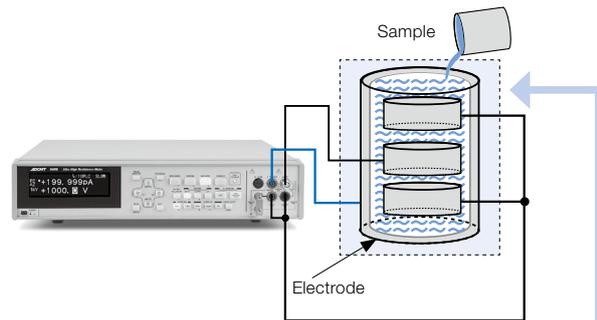
Especially the 6240B produces high-precision results by itself because the thermal electromotive force (Vd) generated on the contact section that may cause an error in low-resistance measurement can be canceled by switching the polarity of measurement current.



Liquid Sample Volume Resistivity Measurement

The volume resistivity of liquid can be measured by using the digital electrometer and the resistivity chamber for liquid sample 12707. This accessory requires only 0.8 cc of sample for measurement.

■ Liquid volume resistivity measurement



<Applicable Electrometer>
 Ultra high resistance meter 5450/5451
 Digital electrometer 5350
 (5350 needs an external power supply.)

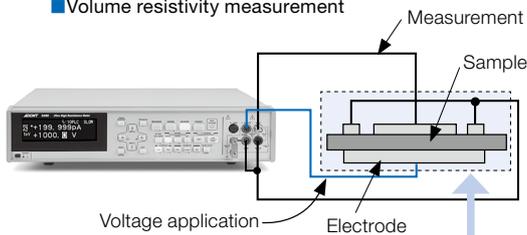


Insulation Material Volume/Surface Resistivity Measurement

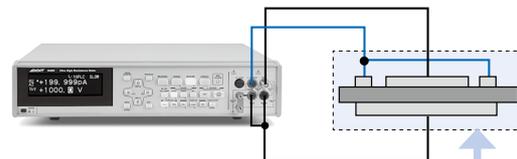
According to JIS K6911 "Testing Methods for Thermosetting Plastics," the digital electrometer can measure the volume or surface resistivity of sheet insulation materials in combination with the resistivity chamber

15042, 12704A or 12702A/B. Especially the 5450/5451 can perform measurement while controlling the discharge, charge or measurement time by using the sequence program.

■ Volume resistivity measurement



■ Surface resistivity measurement



<Applicable Electrometer>
 Ultra high resistance meter 5450/5451
 Digital electrometer 5350
 (5350 needs an external power supply.)

For Tests and Evaluations of LEDs or Other Diodes and Semiconductor Devices

There are various types of semiconductor devices. Particularly, LED lights receive much attention as CO₂ reduction devices because of their power saving and long life characteristics.

Our DC voltage current source monitors have been developed from years of semiconductor test experiences, and have functions and performance to evaluate their characteristics precisely and easily. In addition, free automatic measurement software can be downloaded from our website.

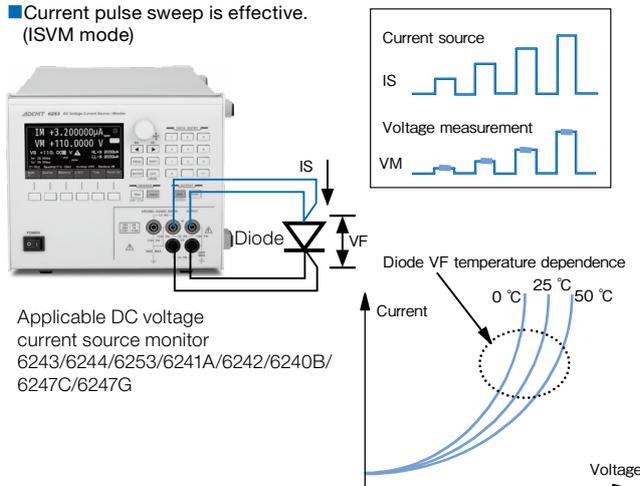
Diode Temperature Dependence Evaluation

The I-V characteristics of power diodes are difficult to measure correctly because of self-heating effect.

To avoid this, the DC voltage current source monitors measure effectively the characteristics applying pulse current.

By using the current pulse sweep function and voltage measurement in synchronous with pulses, precise VF characteristic test with large current is available.

■ Current pulse sweep is effective. (ISVM mode)



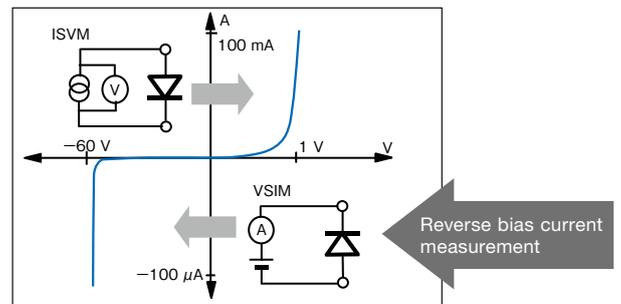
Diode Leak Current Measurement

The DC voltage current source monitors are capable of ISVM (current source voltage measurement) and VSIM (voltage source current measurement).

Diode I-V characteristics are measured by ISVM. In addition, micro leak current can be measured by applying reverse voltage to diodes by VSIM.



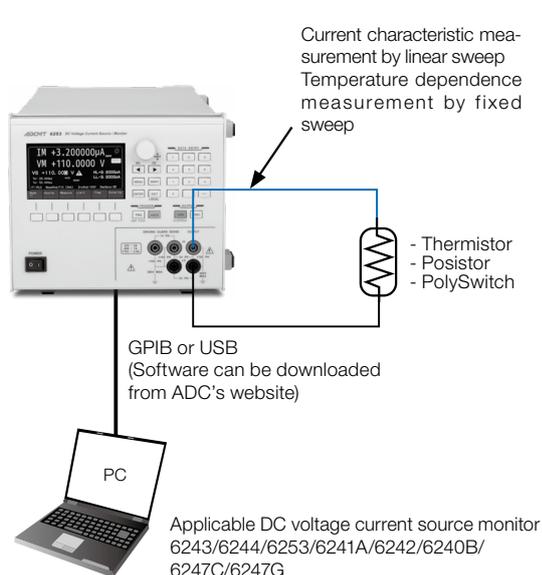
Applicable DC voltage current source monitor
6243/6244/6253/6241A/6242/6240B/6247C/6247G



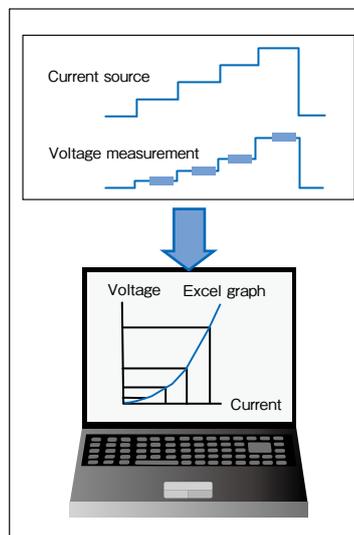
Temperature Dependence Device I-V Measurement

Some devices such as thermistor, posistor and PolySwitch generate heat by receiving current. The DC voltage current sources can measure not only the IV characteristic of these devices but also their temperature dependence by generating constant current and measuring the device

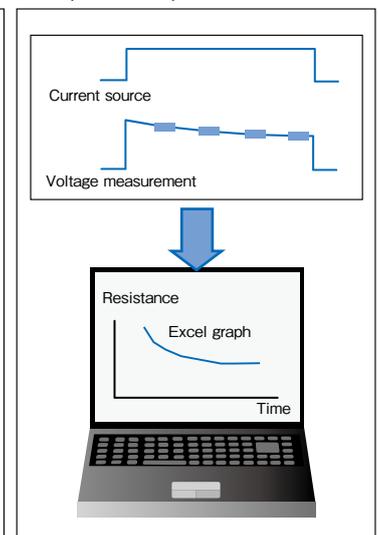
resistance change with time. The measured data is graphed on Excel by using the software downloaded from ADC's website.



■ I-V characteristic measurement



■ Temperature dependence measurement



Digital Multimeters

7351A/7351E/7351E+03



5½-digit

General-purpose and low-cost 5½-digit DMM

- Highest throughput in the class
FAST: 140 readings/s (Max. display of 19999)
MED: 40 readings/s (Max. display of 199999)
- High measurement accuracy of 110 ppm (2 VDC range)
- Wide range of current measurement
Three ranges: 200 mA, 2000 mA, 10 A
- Various interfaces

7451A/7461A



5½-digit/6½-digit (CE)

High-performance and low-cost DMM

- Two models available by use
5½-digit display (7451A)
6½-digit display (7461A)
- Fast sampling : 5,000 readings/s (7451A)
20,000 readings/s (7461A)
- Variable integration time:
100 μs (7451A)/10 μs (7461A) to 10 s
- Two-channel input for DC voltage measurement

7461P



6½-digit (CE)

Thermal DMM capable of temperature measurement with a resolution of 0.001 °C

- Measurement of DC voltage/current, AC voltage/current, resistance and temperature using a Pt sensor
- Fast sampling: 20,000 readings/s
- Data memory: up to 20,000 data
- Digital output capable of remote control of external devices for system use
- Variable integration time: 10 μs to 10 s

	7351A	7351E	7351E+03	7451A	7461A	7461P
Maximum display		199999		319999		1199999
Sampling rate (readings/s)		140 max		5,000 max		20,000 max
Variable integration		—		✓		✓
DC voltage		1 μV to 1000 V		1 μV to 1000 V		100 nV to 1000 V
Accuracy (typical value)		0.011 %/year		0.01 %/year		0.0035 %/year
DC current		1 μA to 10 A		10 nA to 3 A		1 nA to 3 A
Resistance		1 mΩ to 200 MΩ		100 μΩ to 300 MΩ		100 μΩ to 100 MΩ
Four-wire resistance		—		✓		✓
AC voltage (True RMS)		1 μV to 700 V		1 μV to 700 V		100 nV to 700 V
AC voltage frequency range		20 Hz to 100 kHz		20 Hz to 300 kHz		20 Hz to 300 kHz
AC current (True RMS)		1 μA to 10 A		10 nA to 3 A		1 nA to 3 A
Calculation functions		✓		✓		✓
Rear input		—		✓		✓
Temperature		—		—		Pt100 (–200 °C to +850 °C)/JP t 100
Interface	USB, GPIB	USB	USB, RS232	USB, GPIB	USB, GPIB	
Comparator output	—	—	✓	✓	✓	Selectable
Digital output	—	—	—	—	—	
Maximum memory		—		10,000	10,000	20,000
Dimensions (W)x(H)x(D)mm	212×88×340					
Weight (kg)	3.4 or less					

7481



8½-digit

8½-digit high-precision and high-accuracy DMM for system calibration

- 8½-digit display (119 999 999), 0.01 ppm resolution
- High-accuracy measurement by self-calibration function
5 ppm/year (DC voltage measurement relative accuracy)
8 ppm/year (resistance measurement relative accuracy)
- Resistance measurement range: 10 Ω to 1000 MΩ
- Easy calibration by automatic two-source calibration
- Internal memory storage up to 50,000 data

	7481
Maximum display	119 999 999
DC voltage	10 nV to 1000 V
Accuracy (typical value)	5 ppm/year
DC current	100 fA to 1 A
Resistance	1 μΩ to 1000 MΩ
AC voltage (True RMS)	—
AC current (True RMS)	—
Calculation functions	✓
Temperature	✓
Interface	GPIB, USB, LAN (option)
Dimensions (W)×(H)×(D) mm	424×88×450
Weight (kg)	9 or less

7352A/7352E



5½-digit TWIN

5½-digit DMM with built-in twin AD converter that enables two-channel synchronous measurement

- Completely independent two-input, twin-AD converter that creates the new measurement environment
- Double the conventional throughput with synchronous Ach and Bch measurement
- 5½-digit dynamic range for both Ach and Bch
- Wider current measurement range, capable of voltage-temperature parallel measurement
Ach: 10 pA-2 A Bch: 100 μA-10 A

	7352A/7352E	
	Ach	Bch
Maximum display	199999	199999
Sampling rate (readings/s)	140 max	140 max
DC voltage	1 μV to 1000 V	1 μV to 200 V
Accuracy (typical value)	0.011 %/year	
DC current	10 pA to 2 A	100 μA to 10 A
Resistance	1 mΩ to 200 MΩ	—
AC voltage (True RMS)	1 μV to 700 V	—
AC voltage Frequency range	20 Hz to 100 kHz	—
AC current (True RMS)	1 nA to 2 A	100 μA to 10 A
Calculation functions	✓	✓
Rear input temperature	K(CA): -50 °C to 1370 °C T(CC): -50 °C to 400 °C	
Interface	7352A : USB, GPIB, RS232C 7352E : USB	
External trigger input	7352A : ✓ 7352E : —	
Dimensions (W)x(H)x(D)mm	212×88×340	
Weight (kg)	3.7 or less	

Digital Electrometers

5350



For evaluation and testing of semiconductor and electronic components
Low-cost type with 5½-digit display

- Wide current measurement range: 1 fA to 20 mA
- High input impedance of voltage measurement: $10^{13} \Omega$ or more
- High-speed voltage measurement with driving guard
- High-speed measurement: max 1000 readings/s
- Variable integration function: 500 μs to 3.2 s
- Data memory capacity: 100,000 data

5450/5451



Usable in chemical and material fields
Suitable for semiconductor evaluation by voltage sourcing of ±1000V

- Micro current measurement: 1 fA to 19,9999 mA
- Resistance measurement: 10 Ω to $3 \times 10^{17} \Omega$
- Voltage source: ±1000 V, min ±1 mV
- High-speed measurement: max 1000 readings/s
- Floating measurement of 1000 V (5450)
- Easy electric charge/discharge for samples
- Time series graphic display of measurement data
- Sequence program for routine measurement

		5350	5450/5451
Number of digits		5½-digit	5½-digit
Measurement function	Voltage	✓	N/A
	Current	✓	✓
	Resistance	N/A	✓
	Electrical Charge	N/A	N/A
Voltage/Current measurement resolution		1 μV/1 fA	—/1 fA
Resistance	Measurement range	—	10 Ω to $3 \times 10^{17} \Omega$
Voltage source	Range/maximum current	—	±1000 V
	GPIB/USB/LAN	GPIB, USB, LAN (option)	GPIB, USB
Interface	Handler	N/A	✓
	D/A output or analog output	✓	✓

DC Voltage Current Source/Monitors

6240B



Source monitor capable of high-speed pulse source and low-resistance measurement

- Source and measurement range
Voltage: 0 to ± 15 V, Current: 0 to ± 4 A (1 A for DC)
- 5½-digit display with measurement resolution of $1 \mu\text{V}/100 \text{ p}$
- Pulse measurement with minimum pulse width of $50 \mu\text{s}$ and $1 \mu\text{s}$ step
- Low-resistance measurement canceling thermal EMF for conductive materials

6241A/6242



High performance source/monitor capable of pulse source and measurement

- Wide range of generation and measurement functions
Voltage: 0 to ± 32 V; current: 0 to ± 500 mA (6241A)
Voltage: 0 to ± 6 V; current: 0 to ± 5 A (6242)
- High source/measurement resolution
Source: $10 \mu\text{V}/1 \text{ nA}$ Measurement: $1 \mu\text{V}/100 \text{ pA}$
- GPIB/USB interfaces as a standard

		6240B	6241A	6242
Source digits			4½-digit	
Output method			Bipolar	
Maximum output (top) Minimum resolution (bottom)	Voltage	± 15 V/1 A	± 32 V/0.5 A 10 μV	± 6 V/5 A
	Current	± 4 A/10 V (DC: ± 1 A/15 V)	± 0.5 A/32 V 1 nA	± 5 A/6 V
Measurement digits			5½-digit	
Accuracy (typical range)			0.02 %	
Minimum measurement resolution	Voltage		1 μV	
	Current		100 pA	
Maximum measurement range of resistance/ minimum resolution		0.75 M Ω /0.25 $\mu\Omega$	1.6 G Ω /2 $\mu\Omega$	304 M Ω /0.2 $\mu\Omega$
Pulse application/ measurement			✓	
Minimum pulse width			50 μs	
Interface			USB/GPIB	

6540/6541



System-use type

Benchtop type



Compact 4-channel DC voltage/current source monitor

- Source and measurement range
Voltage: 0 to ± 10 V
Current: 0 to ± 500 mA
- Minimum measurement resolution: $10 \mu\text{V} / 10 \text{ pA}$
- Maximum power of 5 W per channel (up to ± 1 A for 4 channels)
- Basic accuracy: $\pm 0.02 \%$
- Minimum pulse width of $50 \mu\text{s}$
- Sink-enabled bipolar output
- Synchronous operation among channels and units

6247C/6247G



Voltage/current source up to 250 V/320 mA Suitable for LED module evaluation

- Source and measurement range:
Voltage: -15 V to $+250$ V
Current: 0 to ± 320 mA
- 5½-digit display with measurement resolution of $10 \mu\text{V}/10 \text{ pA}$
- Minimum pulse width of $50 \mu\text{s}$ and resolution of $1 \mu\text{s}$
- GPIB and USB, or RS232 and USB

		6540	6541	6247C	6247G
Source digits			4½-digit		4½-digit
Output method			Bipolar		Bipolar
Maximum output (top) Minimum resolution (bottom)	Voltage	± 10 V / ± 500 mA (1 A for 4 channels)	100 μV	$+250$ V, -15 V/320 mA	100 μV
	Current	± 500 mA / ± 10 V (1 A for 4 channels)	100 pA	± 320 mA/ $+250$ V, -15 V	100 pA
Measurement digits			5½-digit		5½-digit
Accuracy (typical range)			0.02 %		0.02 %
Minimum measurement resolution	Voltage		10 μA		10 μV
	Current		10 pA		10 pA
Maximum measurement range of resistance/ minimum resolution			5 G Ω /20 $\mu\Omega$		125 G Ω /30 $\mu\Omega$
Pulse application/ measurement			✓		✓
Minimum pulse width			50 μs		50 μs
Interface		USB	USB/GPIB(option)/ LAN(option)	USB/RS232	USB/GPIB

6243/6244



Source/monitor optimum for evaluating electronic circuits (components), with flexible generation and measurement

- Wide range of generation and measurement
Voltage: 0 to ±110 V; current: 0 to ±2 A (6243)
Voltage: 0 to ±20 V; current: 0 to ±10 A (6244)
- 5½-digit display with measurement resolution of 1 µV/100 pA (6243)
5½-digit display with measurement resolution of 1 µV/1 nA (6244)
- Pulse measurement with the minimum pulse width of 1 ms

6253



Best for evaluation of high-precision electronic components by wide source range and 6½-digit measurement resolution

- Source and measurement range
Voltage: 0 to ±110 V, Current: 0 to ±2 A
- 5½ source digits and 6½ measurement digits (measurement resolution: 100 nV/1 pA)
- High-speed pulse source with the minimum pulse width of 25 µs
- Variable integration function
- Variable slew rate function: 10 V/s to 99 kV/s

	6243	6244	6253
Source digits	4½-digit		5½-digit
Output method	Bipolar		
Maximum output (top) Minimum resolution (bottom)	Voltage	±110 V/0.5 A	±110 V/0.5 A
	Current	±2 A/32 V	±2 A/32 V
Measurement digits	5½-digit		6½-digit
Accuracy (typical range)	0.03%		
Minimum measurement resolution	Voltage	1 µV	100 nV
	Current	100 pA	1 pA
Maximum measurement range of resistance/ minimum resolution	-		550 GΩ/0.05 µΩ
Pulse application/ measurement	✓		
Minimum pulse width	1 ms		25 µs
Interface	GPIB		USB/GPIB/LAN (option)/RS232 (option)

DC Voltage Current Sources

6146



4½-digit DC voltage/current source for calibration of electronic circuits and devices

- Wide dynamic range
Voltage: ±32.000 V/Current ±220.00 mA
- High resolution of 1 µV/100 nA steps
- High accuracy with 1 year guarantee
Voltage: ±0.025 %/Current: ±0.03 %
- Synchronous operation of multiple units
- 6144-compatible mode

6156



5½-digit DC voltage/current source as calibrator or secondary battery simulator

- Wide dynamic range
Voltage: ±32.0000 V/Current ±220.000 mA
- High resolution of 100 nV/10 nA steps
- High accuracy with 1 year guarantee
Voltage: ± 0.015 %/Current ± 0.02 %
- Synchronous operation of multiple units
- Thermal electromotive force output function

6166



High-accuracy and highly stable 6½-digit working standard with bipolar output

- Wide dynamic range and high resolution
Voltage: ±10 nV to ±1200 V
Current: ±1 nA to ±120 mA
- High accuracy: ±35 ppm (1-year guarantee)
- High stability: ±5 ppm/24 hrs
- Thermal electromotive force output function

	6146	6156	6166
Source digits	4½-digit	5½-digit	6½-digit
Maximum output (top) Minimum resolution (bottom)	Voltage	±32 V/220 mA	±1200 V/12 mA
	Current	±220 mA/32 V	±120 mA/120 V*
Accuracy (typical range)	Voltage	0.025 %	0.0035 %
	Current	0.03 %	0.0055 %
Thermal electromotive force output	-	-200 °C to 1820 °C, resolution of 0.1 °C	-220 °C to 1820 °C, resolution of 0.1 °C
Settling time	10 ms	10 ms	1 s or less
Output noise (typical range)	3 mVp-p	3 mVp-p	3 mVp-p
Interface	GPIB/USB/BCD-parallel (option)	GPIB/USB/BCD-parallel (option)	GPIB/USB/BCD-parallel (option)

* OPT20 enables the maximum compliance voltage in the 1 mA and 10 mA range to be changed from ±120 V to ±1200 V

Optical Power Meters

These are most suitable optical power meters for R&D and production of LDs, optical pickups, and drivers for optical discs.

You may choose from the three types of mainframes and nine sensors, to suit your needs.

8230E



- 4 ½-digit display
- Low-priced general-purpose sensors and high power sensors are available
- USB interface

8230



- 5 ½-digit display
- Wide lineup of sensors are available for each application
- Automated system may be configured easily with USB

8250A



- 5 ½-digit display
- A desk-top type; equipped with GPIB and USB
- Wide lineup of sensors are available for each application

Optical Sensors

Applicability table for the nine product types of sensors, from low-priced general-purpose ones to those compatible with high power and blu-ray, to suit your needs

			Wavelength/ calibrated wavelength (nm)	Photoreception power/ area	8230E	8230	8250A
General-purpose sensor	Thin type	82311	390 to 1100/780	1 nW to 50 mW/9.5□	✓	✓	✓
	(Option: OPT8230E+11)				✓	—	—
High power sensor	Cylindrical	82321	390 to 1100/780	1 nW to 50 mW/8.5φ	✓	✓	✓
	Thin type	82313	390 to 1100/650	10 nW to 200 mW/8.5φ	✓	✓	✓
Blue-violet sensor	Cylindrical	82323	390 to 1100/650	10 nW to 200 mW/8.5φ	✓	✓	✓
	Thin type	82312	390 to 450/405	10 nW to 100 mW/10□	N/A	✓	✓
Three-wavelength sensor	Cylindrical	82322	390 to 450/405	10 nW to 100 mW/8.5φ		✓	✓
	Thin type	82314A	390 to 900/405	10 nW to 100 mW/10□		✓	✓
Thin-type large-area	Thin-type large-area	82314W	390 to 900/405	10 nW to 100 mW/18□		✓	✓
	Cylindrical	82324A	390 to 900/405	10 nW to 100 mW/8.5φ		✓	✓

* In addition to the calibrated wavelength indicated, calibration with additional wavelengths (405, 650, 780 nm) is possible as an option. However, the optional calibrated wavelengths are not available on the 8230E.

* The wavelength sensitivity of the 82311 and the 82321 is corrected by using the typical values. Correction by measurement is possible with the 82311 as an option. However, this is not possible with the OPT8230E+11.

Optical Wavelength Meter

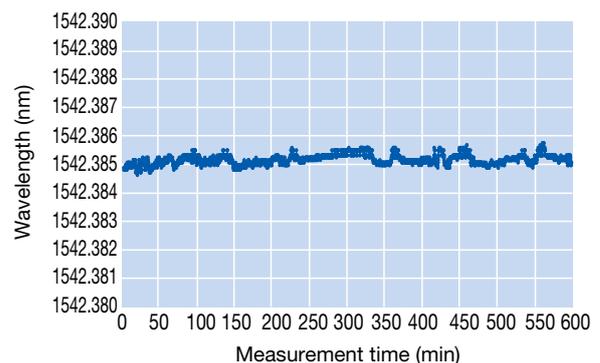
8471



Optical wavelength measurement with high accuracy of 2 ppm and high resolution of 0.001 nm and at high speed of 0.1 second

- Measurement wavelength range: 630 nm to 1650 nm
- Resolution of 0.0001 nm (0.1 pm) by averaging
- High-sensitivity measurement: -35 dBm (1200 nm to 1600 nm)
- Stores up to 10,000 data sets
- Optimal for wavelength adjustment of LDs for DWDM due to high-speed sampling
- Available as a wavelength standard for calibration of spectrometers or optical spectrum analyzers due to high accuracy
- Capable of automated measurement of LD wavelength-temperature and wavelength-current characteristics

Measurement Example of Light Source Stability



Using the interferometer method, the 8471 achieves a maximum resolution of 0.001 nm (1 pm). Moreover, a high measurement resolution of 0.0001 nm (0.1 pm) is possible by performing average measurement of ten times or more. The use of a He-Ne laser as reference wavelength enables a high measurement accuracy of 2 ppm. The He-Ne laser provides oscillation with a highly stable wavelength, assuring high accuracy over a long term without calibration.

4000/4005x Series



- 2-Slot Modular Instrument** 4000
- 1-Channel IR Meter Unit** 40051/40053
- 2-Channel IR Meter Unit** 40052/40054

2U half-size compact mainframe with 2 slots 4000

- Maximum number of modules: 2
- Operation check available via USB on the front panel
- 8-bit digital I/O with power supply of 5 V/200 mA
- 5 V/1 A power supply from the USB POWER
- Interface: USB (front/rear), GPIB, LAN, RS232
- Handler interface: 4 channels

IR meter units 40051/40052/40053/40054

Current/resistance measurement

- Current measurement range: 10 fA to 3.2 mA
- Resistance measurement range: 312 to $3 \times 10^{16} \Omega$
- Measurement method: Integration method
- Input resistance: Switching between 50 Ω and 1 k Ω
- 10 mA current source possible in all the ranges (No change in input resistance)

Voltage source

- Voltage source range: ± 200 V (40051/40052)
 $+300$ V, -100 V (40053/40054)
- Current limiter : 10 μ A to 3.2 mA (Resolution: 1 μ A)
- High-speed CV-CC switching

Contact check

- Capacitance measurement range
0 to 100 pF (Resolution: 0.1 pF/500 kHz, 0.2 pF/315 kHz)
- Output of capacitance measured values

Fixed sweep function

Executes contact check, voltage source, current measurement and comparator judgment by external trigger.

Measurement speed [ms]

Condition: integration time of 1 ms, trigger signal input

		Contact check	
		OFF	ON
INDEX		1.5	3.0
EOM	Including resistance calculation and comparator judgment	1.9	3.4

Systems

SB9700

Li-ion battery charge/discharge test system



For charge/discharge test corresponding to JIS-compliant "Secondary lithium cells"

- Capable of charge/discharge test compliant with JIS C8711 "Secondary lithium cells for portable applications"
- Capable of cycle test by CC/CV discharge and CC discharge using a single unit of DC voltage current source
- Overcharge/overdischarge prevented by the limiter function
Setting the limiter voltage to CV voltage switches CC charge to CV discharge automatically. Setting the limiter voltage to cutoff voltage prevents overdischarge below the cutoff voltage
- Protected batteries by the suspend function
Setting the suspend voltage to discharge cutoff voltage prevents unexpected discharge at measurement start, after measurement end or during pause

6241A/6242 applied

LED/organic EL diode I-V characteristic evaluation system



High-precision I-V characteristic measurement of LEDs/organic EL diodes by pulse sweep function

- I-V characteristic evaluation of LEDs or organic EL diodes is available by installing the free software on a PC and connecting it with the DC voltage current source/monitor via USB or GPIB
- All settings are available from the PC, and data can be loaded into Excel sheets and displayed as an I-V characteristic graph
- The diode self-heating characteristic can be evaluated by the pulse sweep function
- Characteristic changing points can be measured in fine steps

	6241A	6242
Output current	0 to ± 500 mA (resolution 1 nA)	0 to ± 5 A (resolution 1 nA)
Output voltage	0 to ± 32 V (resolution 10 μ V)	0 to ± 6 V (resolution 10 μ V)
Voltage measurement	0 to ± 32 V (resolution 1 μ V)	0 to ± 6 V (resolution 1 μ V)
Current measurement	0 to ± 500 mA (resolution 100 pA)	0 to ± 5 A (resolution 100 pA)

About ADC Corporation

ADC Corporation is a manufacturer specialized in testing and measurement that became an independent firm by management buyout from ADVANTEST in April 2003.

We have developed mother technologies to measure electric and physical quantities accurately, by combining our analog measurement technologies developed for over 50 years with digital technologies, and provided general measuring instruments that support many cutting-edge technologies.

Our mission is to pursue the essence of generic measuring instruments by developing innovative measurement technologies using accumulated analog technologies so as to contribute to the development of cutting-edge technologies continuously. In keeping with the mission, we will be growing with our customers by quick decision-making and flexible customer support.

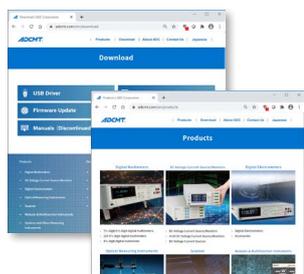
■ Corporate Profile

Company name	ADC Corporation
House mark	ADCMT
Founded	July 1, 1971
Representative Director and President	Hiroshi Mochida
Capital	126 million yen
Head Office	Saitama, Japan



▲ Head office

Sales support



■ Website

Our products are described in more detail on our website. The features, application examples and specifications are shown for each product, and downloading of brochures is also possible.

■ Software downloading

You can download sample programs for automation, USB driver, and LabVIEW driver from our website, when using our products as a part of automated systems.

Quality assurance

■ Measurement results are guaranteed

With highly accurate digital measuring instruments, even a minute discrepancy with the national standards could pose a problem. ADC Corporation has periodically maintained and managed the in-house standard equipment and traced the national standards. In addition, ADC is accredited as an international MRA by JCSS (Japan Calibration Service System) as of September, 2013. Our DC voltage source units achieve measurement uncertainty of 0.3 PPM at 10V.

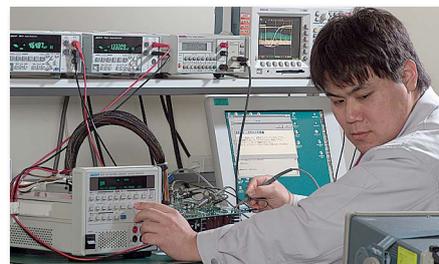


■ Acquired ISO9001 certificate

ADC Corporation has obtained ISO9001 quality management system certificate.



Warranty and maintenance



■ Warranty

In order to supply highly reliable products, we prevent mixing of defective products beforehand under stringent inspection system, at the same time designing products with backup of reliability design and technical standards. The products we deliver are guaranteed for a specified period, pursuant to our in-house standards.

■ Maintenance

We have established a thorough after-sales system so that you can use your measuring instruments securely over a long period even when they failed. Furthermore, we have configured a service network in order to offer prompt services, and have strived to secure maintenance parts and hand down technologies.



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