

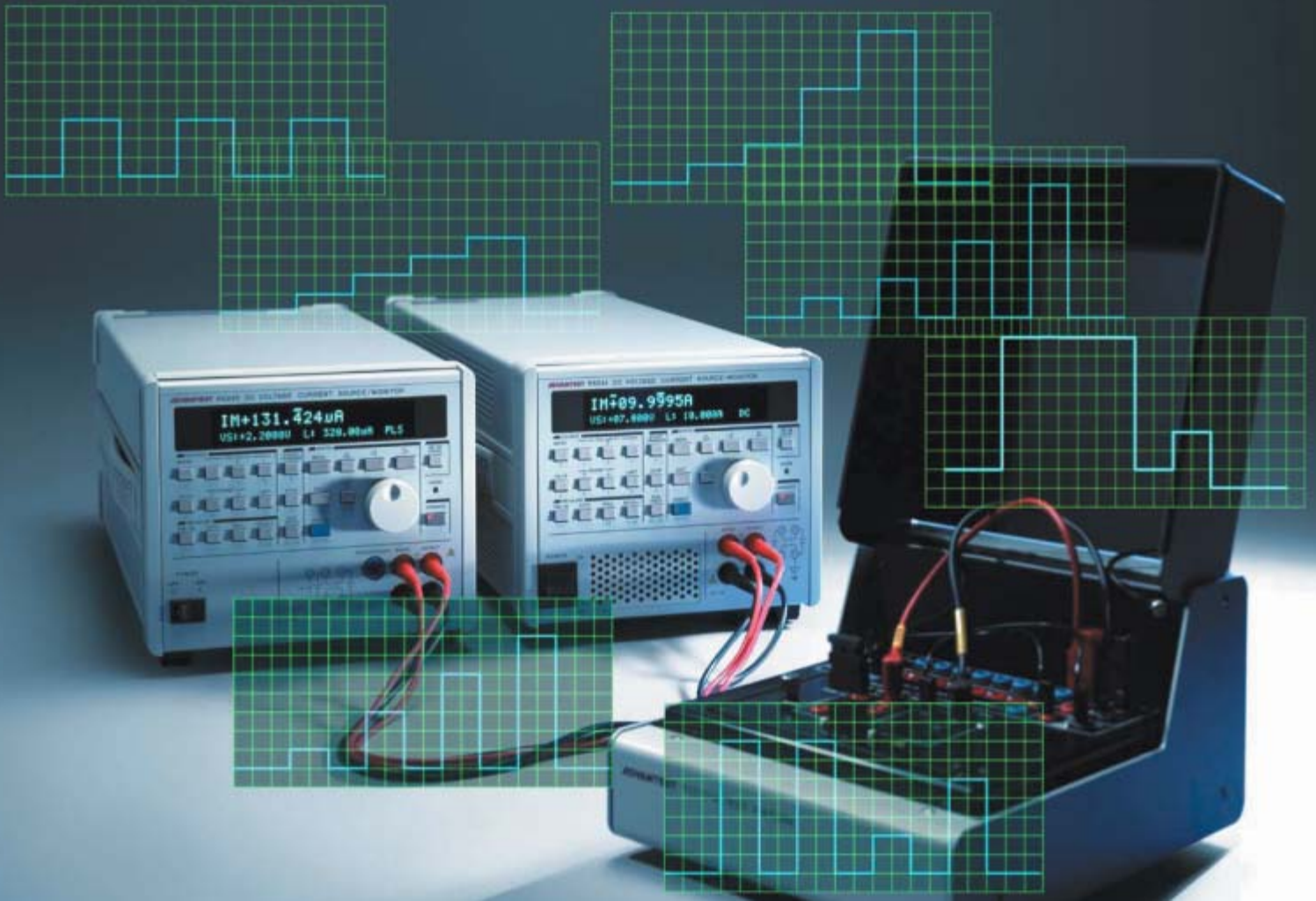
ADVANTEST

R6243/6244
DC Voltage Current Source/Monitor

Optimal for Evaluating Electronic Circuits (Parts) with Flexible
Source and Measurement of DC Voltage and Current



R6243/6244



R6243/6244 is a DC voltage and current source/monitor with wide ranges of generation and measurement.
R6243: Voltage = 0 to ±110 V, current = 0 to ±2 A
R6244: Voltage = 0 to ±20 V, current = 0 to ±10 A
 The R6243/6244 provide high accuracy with a setting resolution of 4 1/2 digits and a measuring resolution of 5 1/2 digits, a variety of sweep functions and a pulse measuring function for the minimum pulse width of 1 ms. The R6243/6244 can be used a power supply in many applications such as for test system, for evaluations of semiconductors and other electronic parts in R&D, etc.,

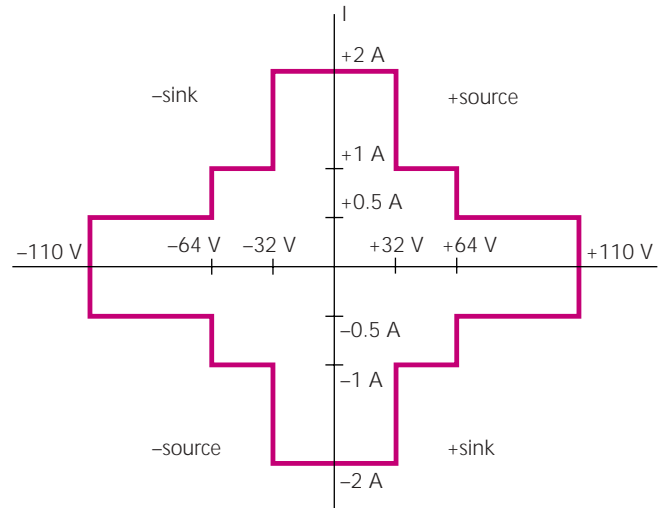
	R6243	R6244
Maximum output current	±2 A at up to ±32 V ±1 A at up to ±64 V ±0.5 A at up to ±110 V	±10 A at up to ±7 V ±4 A at up to ±20 V
Voltage source/measurement range	320 mV to 110 V	320 mV to 20 V
Current source/measurement range	32 µA to 2 A	320 µA to 10 A
Number of digits		
Source measurement		4 1/2
Measurement		5 1/2
Voltage source/measurement resolution		
Source measurement		10 µV
Measurement		1 µV
Current source/measurement resolution		
Source measurement	1 nA	10 nA
Measurement	100 pA	1 nA

- Voltage source and current measurement (VSIM)/ Current source and voltage measurement (ISVM)
- Voltage source and voltage measurement (VSVM)/ Current source and current measurement (ISIM)
- Sink enabled bipolar output
- Minimum pulse width: 1 ms
- Linear, logarithmic, and random sweep functions for characteristics tests
- Limiter (compliance), oscillation, overload, and overheat detection functions
- Synchronous operation function by combining two R6243/6244s or more
- GPIB for automatic measuring system

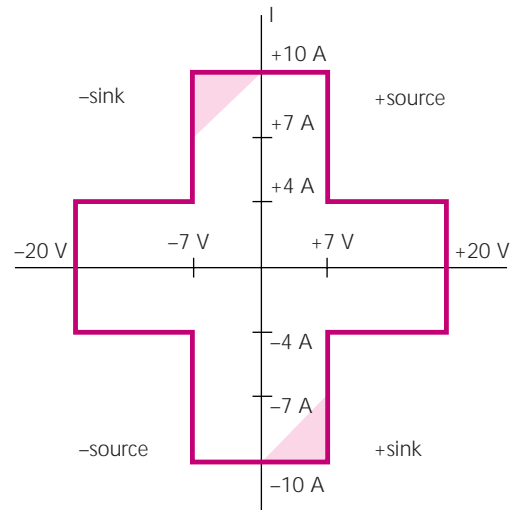


Output Range

R6243



R6244

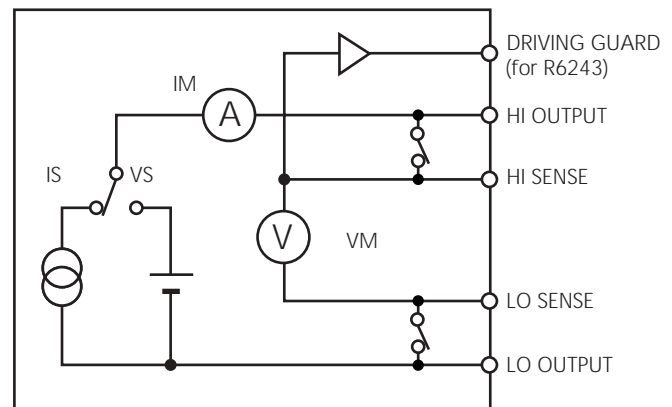


parts: The operating environmental temperature is 0 to 40°C

Source and Measurement Functions

Voltage source/current source and voltage measurement/current measurement can be selected.

R6243/6244



Source Modes

The R6243/6244 has four source modes – DC, pulse, DC sweep, and pulse sweep. The sweep can be selected three types of mode such as linear, log, and random (arbitrary waveform generation by user programming).

Mode	DC	Pulse
Continuous Spot		
Linear Sweep		
Log Sweep		
Random Sweep		

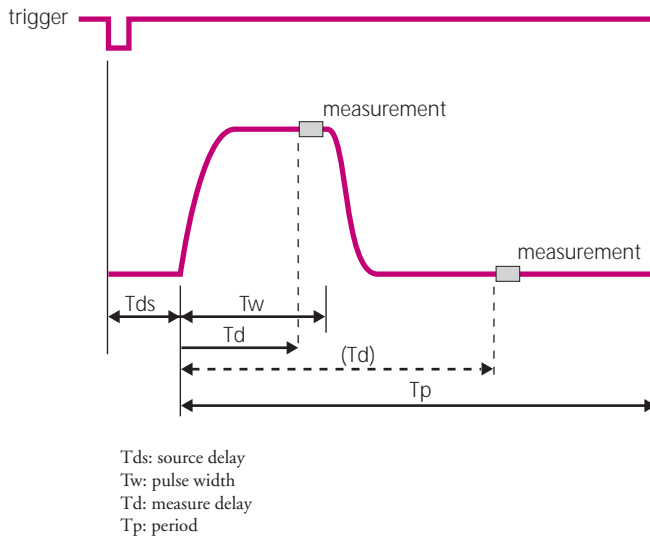
The R6243/6244 can generate a pattern for a device test without exchanging data with an external controller. Further it can read out measurement results from the memory after the test.

Note: The pulses across polarities cannot be generated.

Source/Measurement Timing

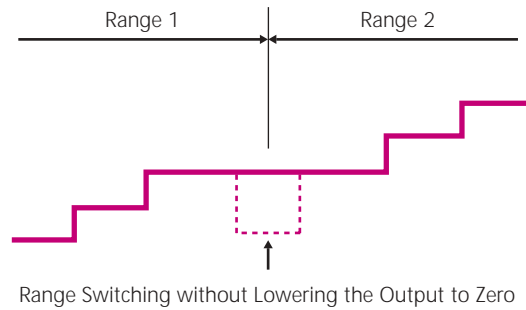
In pulse and sweep modes, the source and measurement timings are synchronous and the measurement is permitted after a specified time from trigger.

Setting the measure delay (Td) permits a measurement after a specified time from the end of the pulse such as stress tests.



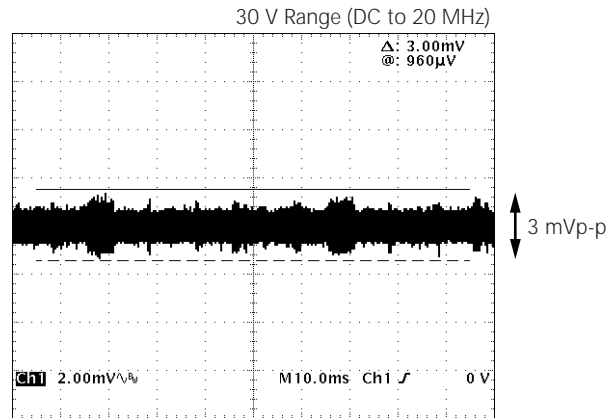
Range Switching without Discontinuity

The voltage and current source ranges can be changed without lowering the output to zero from the level before switching. This allows no discontinuity at the output and reduces adverse effects on devices with hysteresis or high dielectric constant.

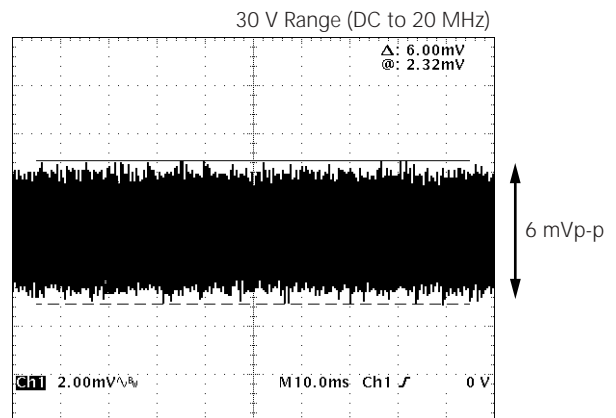


Low Noise

The basic requirements for power supply performance are accuracy of the voltage/current source and measuring against the noise added on the output voltage/current. The R6243/6244 has a minimum-noise design effective for the case susceptible to power noise and input signals of DC amplifier. The R6243/6244 is the perfect power supply for a linear IC, optical device, or mobile communication amplifier.



Output noise of R6243/6244

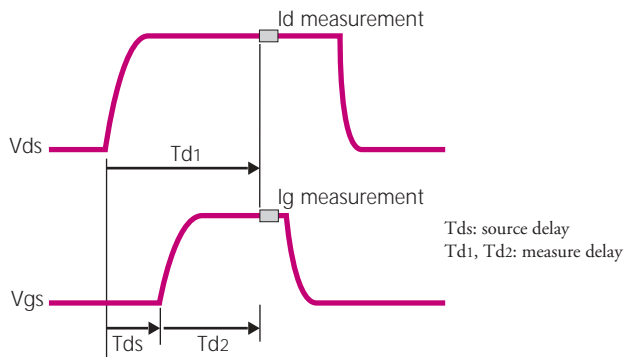
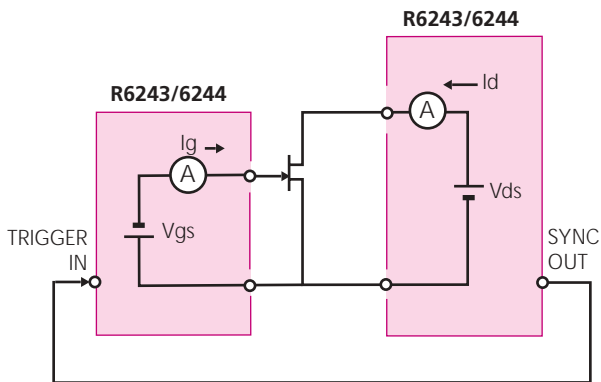


Output noise of our conventional models

For a transistor, FET characteristics test

In a transistor or FET characteristics test, two units of R6243/6244 can be used for simultaneous measurement. The R6243/6244 controls the generation timings of the drain and gate voltage to protect a device from stress. It can measure I_d and I_g simultaneously.

- Linear, log, and random sweep functions
- Pulse measurement (minimum pulse width: 1 ms)
- Measure delay function for measurement timing control
- Source delay function for generation timing control

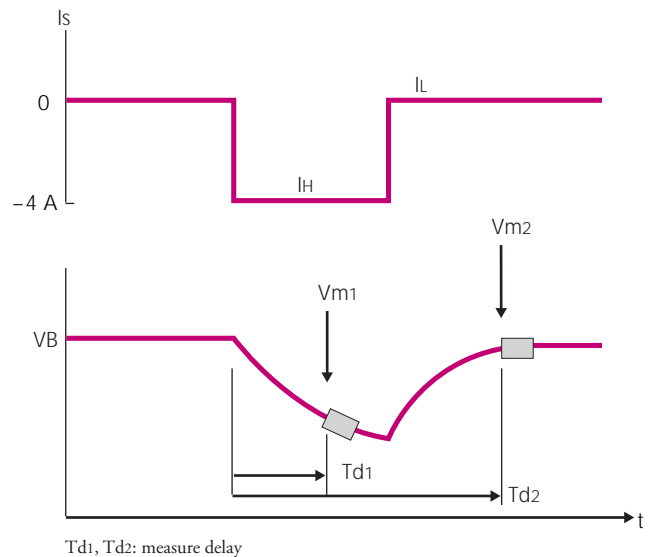
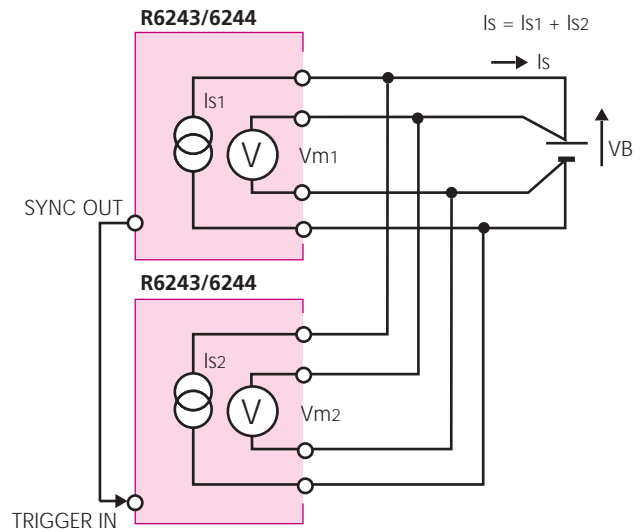


Measurement example of FET

For a battery charge and discharge test

The R6243/6244 is available for a battery charge and discharge test at constant current (CC) or constant voltage (CV) by DC or pulse applications. For a pulse charge and discharge test, measurement is necessary while and after the pulse application. Two units of R6243/6244 can be used in parallel operation for measurement at the above two points and to increase the current capacity up to 20 A.

- Source sink current up to ± 20 A (7 V)
- 20 A (R6244) and 4 A (R6243) by two units in parallel operation
- Measurement at pulse HI/LO point
- Selection of voltage or current measurement

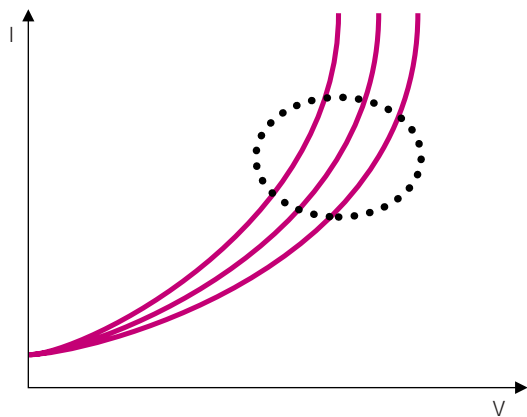
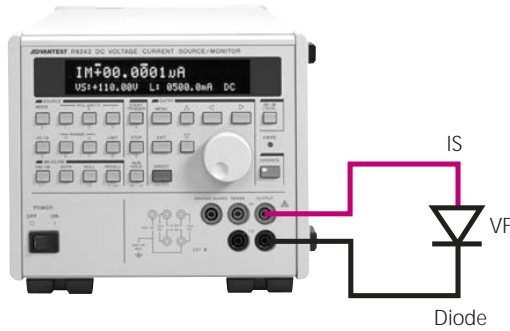


Example of Battery Charge and Discharge Test

For a temperature dependency test of diode Vf

In a characteristics test on a power diode, applying a pulse current is effective for avoiding the influence of self-heating. The current pulse sweep function and the pulse-synchronous voltage measurement ensure accurate Vf characteristics test at a large current.

Current pulse sweep ISVM



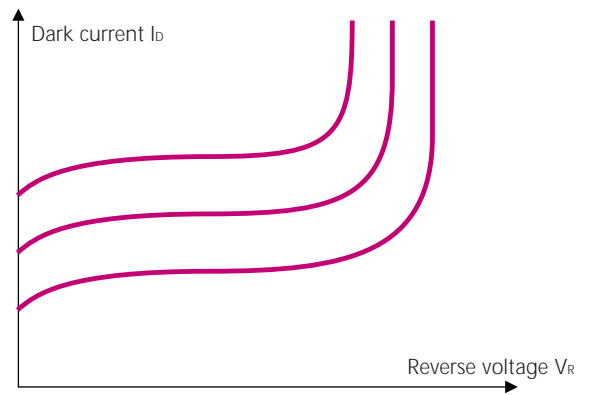
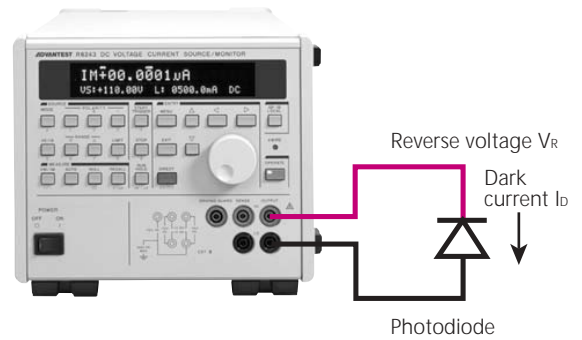
Temperature Dependence of Vf by Pulse Width Variation

For a dark current characteristics test of photodiode

The following functions of R6243 are effective for photodiode characteristics test:

- Dark current – reverse voltage characteristics test function using the 100 pA resolution
- Breakdown voltage measurement by ±110 V source and comparator

DC voltage sweep VSIM

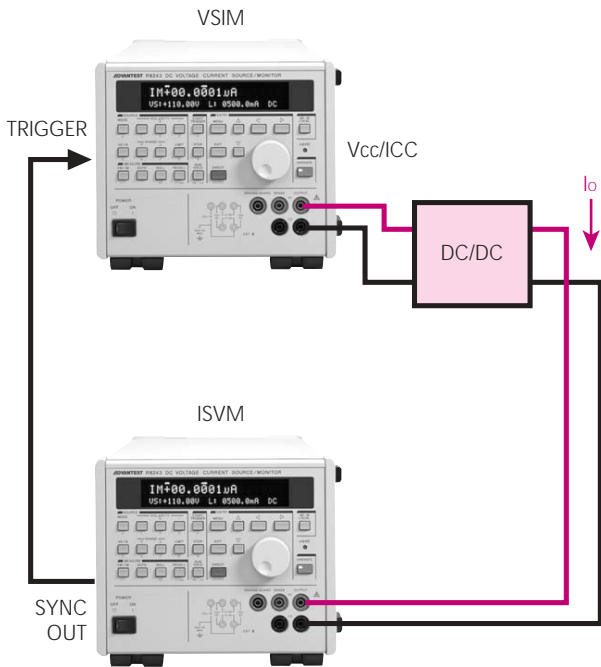


Temperature Dependence of the Dark Current – Reverse Voltage Characteristic

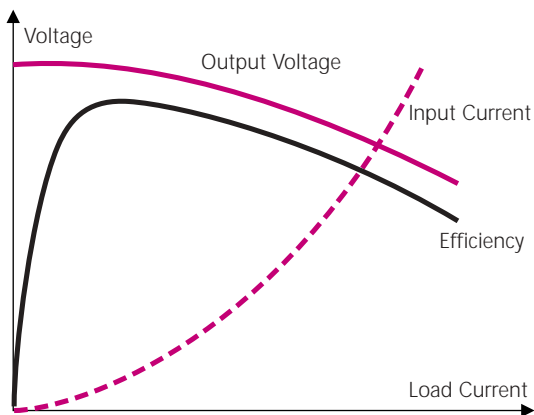
For a DC/DC converter characteristics test

The following functions are effective for DC/DC converter characteristics test:

- Simultaneous measurement of input current and output voltage/current by using two units of R6243/6244
- Electronic load operates even at 0 V (General electronic loads do not operate at 0.8 V or less)
- Large output current up to 10 A (7 V) (R6244)



Synchronous Measurement of Input Current and Output Voltage

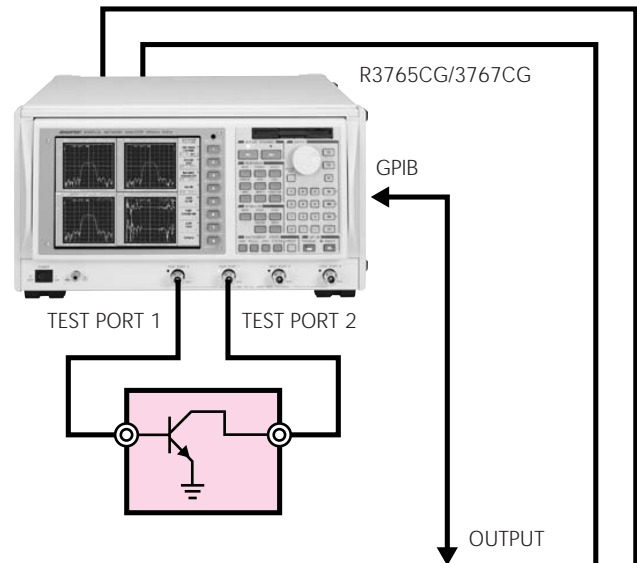


Example of Evaluating High-frequency Transistor Characteristics

- Measuring the S parameter by a Network Analyzer and converting it into the h parameter
- Searching I_b as the prescribed I_c R6243 control using the built-in basic functions of the Network Analyzer
- Measuring the S parameter between 300 kHz and 8 GHz by sweep measurement and saving the data to floppy disk
- Converting the S parameter into the h parameter and creating a graph on a PC

Measurement items

- DC current gain vs Collector current characteristic
- Small-signal current gain vs Frequency characteristic
- Forward transfer gain vs Collector current characteristic
- Gain-bandwidth product vs Collector current characteristic
- Forward transfer gain vs Frequency characteristic
- Forward transfer gain vs Collector-emitter voltage characteristic



Setting example

Measuring frequency

- R3767CG: 300 kHz to 8 GHz
- R3765CG: 300 kHz to 3.8 GHz

DC current measurement

- R6243: 100 pA to ± 0.5 A

DC voltage and current source

- R6243: 10 μ V to ± 30 V

- R6243: 1 nA to ± 0.5 A

Application from the BIAS port of Network Analyzer



R6243

OUTPUT



R6243

Specifications

All accuracies are guaranteed for one year when used at temperatures of $23 \pm 5^\circ\text{C}$, relative humidity 85% or less.

R6243

Voltage Source/Measurement Range

Range	Source Range	Setting Resolution	Measurement Range	Measurement Resolution
320 mV	0 to ± 320.00 mV	10 μV	0 to ± 320.000 mV	1 μV
3.2 V	0 to ± 3.2000 V	100 μV	0 to ± 3.20000 V	10 μV
32 V	0 to ± 32.000 V	1 mV	0 to ± 32.0000 V	100 μV
110 V	0 to ± 110.00 V	10 mV	0 to ± 110.000 V	1 mV

Current Source/Measurement Range

Range	Source Range	Setting Resolution	Measurement Range	Measurement Resolution
32 μA	0 to ± 32.000 μA	1 nA	0 to ± 32.0000 μA	100 pA
320 μA	0 to ± 320.00 μA	10 nA	0 to ± 320.000 μA	1 nA
3.2 mA	0 to ± 3.2000 mA	100 nA	0 to ± 3.20000 mA	10 nA
32 mA	0 to ± 32.000 mA	1 μA	0 to ± 32.0000 mA	100 nA
320 mA	0 to ± 320.00 mA	10 μA	0 to ± 320.000 mA	1 μA
2 A	0 to ± 2000.0 mA	100 μA	0 to ± 2000.00 mA	10 μA

At the Integration Times of 500 μs and 1 ms, the measurement resolution is as follows:

Integration time	500 μs	1 ms
Measurement Resolution (digits)	5	3

Voltage Limiter (Compliance) Range

Range	Maximum Setting	Minimum Setting	Setting Resolution
320 mV	320.00 mV	3 mV	10 μV
3.2 V	3.2000 V	30 mV	100 μV
32 V	32.000 V	300 mV	1 mV
110 V	110.00 V	3 V	10 mV

Current Limiter (Compliance) Range

Range	Maximum Setting	Minimum Setting	Setting Resolution
32 μA	32.000 μA	300 nA	1 nA
320 μA	320.00 μA	3 μA	10 nA
3.2 mA	3.2000 mA	30 μA	100 nA
32 mA	32.000 mA	300 μA	1 μA
320 mA	320.00 mA	3 mA	10 μA
2 A	2000.0 mA	30 mA	100 μA

Total Accuracy: Including calibration accuracy, 1-day stability, temperature coefficient, and linearity

1-day Stability: For power source, under a constant load

Temperature coefficient: At Temperature of 0 to 50°C

Voltage Source/Voltage Limiter

Range	Total Accuracy	1-day Stability	Temperature coefficient
	$\pm(\%$ of setting + V)		$\pm(\text{ppm of setting + V})/^\circ\text{C}$
320 mV	0.03 + 200 μV	0.01 + 100 μV	15 + 20 μV
3.2 V	0.03 + 600 μV	0.01 + 300 μV	15 + 50 μV
32 V	0.03 + 6 mV	0.01 + 3 mV	15 + 500 μV
110 V	0.03 + 30 mV	0.01 + 20 mV	15 + 2 mV

Current Source/Current Limiter

Range	Total Accuracy	1-day Stability	Temperature coefficient
	$\pm(\%$ of setting + A + A x Vo/1 V)		$\pm(\text{ppm of setting + A + A x Vo/1 V})/^\circ\text{C}$
32 μA	0.03 + 10 nA + 300 pA	0.015 + 4 nA + 200 pA	25 + 1 nA + 10 PA
320 μA	0.03 + 100 nA + 3 nA	0.015 + 40 nA + 2 nA	25 + 10 nA + 100 PA
3.2 mA	0.03 + 1 μA + 30 nA	0.01 + 400 nA + 20 nA	20 + 100 nA + 1 nA
32 mA	0.03 + 10 μA + 300 nA	0.01 + 4 μA + 200 nA	20 + 1 μA + 10 nA
320 mA	0.05 + 100 μA + 3 μA	0.015 + 40 μA + 2 μA	20 + 10 μA + 100 nA
2 A	0.06 + 1 mA + 30 μA	0.03 + 400 μA + 20 μA	20 + 100 μA + 1 μA

Vo: Compliance Voltage (0 to ± 110 V)

Voltage Measurement

Range	Total Accuracy	1-day Stability	Temperature coefficient
	$\pm(\%$ of reading + V)		$\pm(\text{ppm of reading + V})/^\circ\text{C}$
320 mV	0.03 + 100 μV	0.008 + 50 μV	15 + 8 μV
3.2 V	0.03 + 150 μV	0.008 + 100 μV	15 + 10 μV
32 V	0.03 + 1 mV	0.008 + 500 μV	15 + 50 μV
110 V	0.03 + 8 mV	0.008 + 3 mV	15 + 500 μV

Current Measurement

Range	Total Accuracy	1-day Stability	Temperature coefficient
	$\pm(\%$ of reading + A + A x Vo/1 V)		$\pm(\text{ppm of reading + A + A x Vo/1 V})/^\circ\text{C}$
32 μA	0.03 + 8 nA + 300 pA	0.015 + 3.5 nA + 200 pA	25 + 600 pA + 10 PA
320 μA	0.03 + 80 nA + 3 nA	0.015 + 35 nA + 2 nA	25 + 6 nA + 100 PA
3.2 mA	0.03 + 800 nA + 30 nA	0.01 + 350 nA + 20 nA	20 + 60 nA + 1 nA
32 mA	0.03 + 8 μA + 300 nA	0.01 + 3.5 μA + 200 nA	20 + 600 nA + 10 nA
320 mA	0.05 + 80 μA + 3 μA	0.015 + 35 μA + 2 μA	20 + 6 μA + 100 nA
2 A	0.06 + 800 μA + 30 μA	0.03 + 350 μA + 20 μA	20 + 60 μA + 1 μA

Vo: Compliance Voltage (0 to ± 110 V)(Auto Zero: ON, Integration Time: 1 to 100 PLC)

Integration time: For 10 ms to 500 μs measurement accuracy and 1-day stability, the following error is added.

	Range	Integration time		
		10 ms	1 ms	500 μs
Voltage Measurement	320 mV	30	50	60
	3.2 V to 20 V	6	12	15
Current Measurement	32 μA	30	50	70
	320 μA	15	25	30
	3.2 mA to 2 A	10	15	20

Source Linearity: $\pm 0.01\%$ of range

Maximum Output Current: ± 2 A at up to 32 V, ± 1 A at up to 64 V, ± 0.5 A at up to 110 V

Maximum Compliance Voltage: ± 110 V at up to 0.5 A, ± 64 V at up to 1 A, ± 32 V at up to 2 A

R6244**Voltage Source/Measurement Range**

Range	Source Range	Setting Resolution	Measurement Range	Measurement Resolution
320 mV	0 to ±320.00 mV	10 µV	0 to ±320.000 mV	1 µV
3.2 V	0 to ±3.2000 V	100 µV	0 to ±3.20000 V	10 µV
20 V	0 to ±20.000 V	1 mV	0 to ±20.0000 V	100 µV

Current Source/Measurement Range

Range	Source Range	Setting Resolution	Measurement Range	Measurement Resolution
320 µA	0 to ±320.00 µA	10 nA	0 to ±320.000 µA	1 nA
3.2 mA	0 to ±3.2000 mA	100 nA	0 to ±3.20000 mA	10 nA
32 mA	0 to ±32.0000 mA	1 µA	0 to ±32.00000 mA	100 nA
320 mA	0 to ±320.00 mA	10 µA	0 to ±320.000 mA	1 µA
3.2 A	0 to ±3200.0 mA	100 µA	0 to ±3200.00 mA	10 µA
10 A	0 to ±10.000 A	1 mA	0 to ±10.0000 A	100 µA

At the Integration Times of 500 µs and 1 ms, the measurement resolution is as follows

Integration time	500 µs	1 ms
Measurement Resolution (digits)	5	3

Voltage Limiter (Compliance) Range

Range	Maximum Setting	Minimum Setting	Setting Resolution
320 mV	320.00 mV	3 mV	10 µV
3.2 V	3.2000 V	30 mV	100 µV
20 V	20.000 V	300 mV	1 mV

Current Limiter (Compliance) Range

Range	Maximum Setting	Minimum Setting	Setting Resolution
320 µA	320.00 µA	3 µA	10 nA
3.2 mA	3.2000 mA	30 µA	100 nA
32 mA	32.000 mA	300 µA	1 µA
320 mA	320.00 mA	3 mA	10 µA
3.2 A	3200.0 mA	30 mA	100 µA
10 A	10.000 A	300 mA	1 mA

Total Accuracy: Including calibration accuracy, 1-day stability, temperature coefficient, and linearity

1-day Stability: For power source, under a constant load

Temperature coefficient: At Temperature of 0 to 50°C

Voltage Source/Voltage Limiter

Range	Total Accuracy	1-day Stability	Temperature coefficient
	±(% of setting + V)		±(ppm of setting + V)/°C
320 mV	0.03 + 300 µV	0.01 + 150 µV	15 + 30 µV
3.2 V	0.03 + 600 µV	0.01 + 300 µV	15 + 50 µV
20 V	0.03 + 6 mV	0.01 + 3 mV	15 + 500 µV

Current Source/Current Limiter

Range	Total Accuracy	1-day Stability	Temperature coefficient
	±(% of setting + A + A x Vo/1 V)		±(ppm of setting + A + A x Vo/1 V)/°C
320 µA	0.03 + 100 nA + 3 nA	0.015 + 42 nA + 2 nA	25 + 10 nA + 100 pA
3.2 mA	0.03 + 1 µA + 30 nA	0.01 + 420 nA + 20 nA	20 + 100 nA + 1 nA
32 mA	0.03 + 10 µA + 300 nA	0.01 + 4.2 µA + 200 nA	20 + 1 µA + 10 nA
320 mA	0.05 + 100 µA + 3 µA	0.015 + 42 µA + 2 µA	20 + 10 µA + 100 nA
3.2 A	0.06 + 1 mA + 30 µA	0.03 + 420 µA + 20 µA	20 + 100 µA + 1 µA
10 A	0.1 + 10 mA + 300 µA	0.08 + 4.2 mA + 200 µA	90 + 1 mA + 10 µA

Vo; Compliance Voltage (0 to ±20 V)

Voltage Measurement

Range	Total Accuracy	1-day Stability	Temperature coefficient
	±(% of reading + V)		±(ppm of reading + V)/°C
320 mV	0.03 + 200 µV	0.008 + 100 µV	15 + 20 µV
3.2 V	0.03 + 200 µV	0.008 + 100 µV	15 + 20 µV
20 V	0.03 + 1 mV	0.008 + 500 µV	15 + 50 µV

Current Measurement

Range	Total Accuracy	1-day Stability	Temperature coefficient
	±(% of reading + A + A x Vo/1 V)		±(ppm of reading + A + A x Vo/1 V)/°C
320 µA	0.03 + 80 nA + 3 nA	0.015 + 40 nA + 2 nA	25 + 8 nA + 100 pA
3.2 mA	0.03 + 800 nA + 30 nA	0.01 + 400 nA + 20 nA	20 + 80 nA + 1 nA
32 mA	0.03 + 8 µA + 300 nA	0.01 + 4 µA + 200 nA	20 + 800 nA + 10 nA
320 mA	0.05 + 80 µA + 3 µA	0.015 + 40 µA + 2 µA	20 + 8 µA + 100 nA
3.2 A	0.06 + 800 µA + 30 µA	0.03 + 400 µA + 20 µA	20 + 80 µA + 1 µA
10 A	0.1 + 8 mA + 300 µA	0.08 + 4 mA + 200 µA	90 + 800 µA + 10 µA

Vo; Compliance Voltage (0 to ±20 V)(Auto Zero: ON, Integration Time: 1 to 100 PLC)

Integration time: For 10 ms to 500 µs measurement accuracy and 1-day stability, the following error is added.

	Range	Integration time		
		10 ms	1 ms	500 µs
Voltage Measurement	320 mV	30	50	60
	3.2 V to 20 V	6	12	15
Current Measurement	320 µA	15	25	30
	3.2 mA to 10 A	10	15	20

Source Linearity: ±0.012% of range

At the range of 320 mA, 3.2 A, 10 A, the following error is added.

	Range	±(% of setting)
Current Source	320 mA	0.01
	3.2 A	0.02
	10 A	0.07

Maximum Output Current: ±10 A at up to 7 V, ±4 A at up to 20 V

Maximum Compliance Voltage: ±20 V at up to 4 A, ±7 V at up to 10 A

R6243/6244 Common Specifications

R6243/6244 Range Table

	Range	R6243	R6244
Voltage Source/ Voltage Limiter	320 mV	YES	YES
	3.2 V	YES	YES
	20 V	No	YES
	32 V	YES	No
	110 V	YES	No
Current Source/ Current Limiter	32 μ A	YES	No
	320 μ A	YES	YES
	3.2 mA	YES	YES
	32 mA	YES	YES
	320 mA	YES	YES
	2 A	YES	No
	3.2 A	No	YES
	10 A	No	YES

Voltage/Current Source

Total Accuracy of Reverse Polarity Limiter: Accuracies of source value and reverse polarity limiter are the values in the table below, plus the limiter total accuracy. (The table does not apply to the stability or temperature coefficient.)

	Range	Total Accuracy \pm (% of setting + V)
Reverse Polarity/ Voltage Limiter	320 mV	0.25 + 8 mV
	3.2 V	0.25 + 8 mV
	20 V/32 V	0.25 + 80 mV
	110 V	0.25 + 300 mV
Reverse Polarity/ Current Limiter	32 μ A	0.25 + 650 nA
	320 μ A	0.25 + 6.5 μ A
	3.2 mA	0.25 + 65 μ A
	32 mA	0.25 + 650 μ A
	320 mA	0.25 + 6.5 mA
	2 A/3.2 A	0.25 + 65 mA
	10 A	0.25 + 650 mA

Output Noise: Voltage source is no load and within maximum load [Vp-p].
Current source is at the following load resistance [Ap-p].

Voltage Source

Range	Load resistance	Low Frequency Noise		High Frequency Noise
		DC to 100 Hz	DC to 10 kHz	DC to 20 MHz
320 mV	-	60 μ V	300 μ V	5 mV
3.2 V	-	100 μ V	400 μ V	5 mV
20 V/32 V	-	1 mV	3 mV	6 mV
110 V	-	3 mV	5 mV	10 mV

Current Source

Range	Load resistance	Low Frequency Noise		High Frequency Noise
		DC to 100 Hz	DC to 10 kHz	DC to 20 MHz
32 μ A	10 k Ω	10 nA	60 nA	500 nA
320 μ A	10 k Ω	30 nA	150 nA	600 nA
3.2 mA	1 k Ω	200 nA	2 μ A	6 μ A
32 mA	1 k Ω	2 μ A	15 μ A	20 μ A
320 mA	1 k Ω	20 μ A	100 μ A	150 μ A
2 A/3.2 A	100 Ω	200 μ A	1 mA	1.5 mA
10 A	10 Ω	2 mA	10 mA	15 mA

Transient Noise at switchings:

		Typical values [p-p]	Load resistance
Output On/ Off Noise	Voltage Source	600 mV	at 100 k Ω
	Current Source	600 mV	at 100 k Ω
Range Changing Transient Noise	Voltage Source	50 mV	-
	Current Source	70 digits + 50 mV	-
	Voltage Limiter	50 mV ^(*)	-
	Current Limiter	50 mV ^(*) ^(**)	-
	Voltage Measurement Current Measurement	50 mV ^(*)	-
Polarity Changing Transient Noise	Voltage Source	50 mV	-
	Current Source	50 mV/RL	RL
Power Source Off Noise		600 mV	at 100 k Ω

(*) 80 mV when the voltage source range is 110 V.

(**) Not during limiter operation. During limiter operation, this is the same as the source range switching noise.

RL: Resistance of Load value

Settling Time:

The time to reach maximum value $\pm 0.03\%$ when output shifts from zero to Full Scale. However pure load resistance, load capacitance 2.5 pF or less, source value, and Limiter setting are at Full Scale.

	Range	Settling Time
Voltage Source	320 mV	300 μ s or less
	3.2 V	
	20 V/32 V	700 μ s or less
	110 V	2 ms or less
Current Source	32 μ A	5 ms or less
	320 μ A	3 ms or less
	3.2 mA	
	32 mA	
	320 mA	
	2 A/3.2 A	
	10 A	

Line Regulation:

$\pm 0.003\%$ of range

Load Regulation

Voltage Source: $\pm 0.003\%$ of range or less For maximum load at 4 wire kelvin connection.

Current Source: By CMV ($A \times V_o/1 V$) of the total accuracy.

Output Resistance: For 2 wire connection. However output cable is not included.

Maximum Load capacitance: Maximum load capacitance with no oscillation during voltage source or voltage Limiter operation.

Range	Output Resistance		Maximum Load Capacitance
	Voltage Source	Current Source	
32 μ A	500 m Ω or less	1 x 10 ⁹ Ω or more	1 μ F
320 μ A	100 m Ω or less	1 x 10 ⁹ Ω or more	1 μ F
3.2 mA	10 m Ω or less	1 x 10 ⁸ Ω or more	100 μ F
32 mA	10 m Ω or less	1 x 10 ⁷ Ω or more	100 μ F
320 mA	10 m Ω or less	1 x 10 ⁶ Ω or more	2000 μ F
2 A/3.2 A	10 m Ω or less	1 x 10 ⁵ Ω or more	2000 μ F
10 A	10 m Ω or less	1 x 10 ⁴ Ω or more	2000 μ F

Standard attached cable resistance: 100 m Ω or less

Maximum Inductive load:

Maximum inductive load with no oscillation during current source or current limiter operation.

Current Source Range	32 μ A	320 μ A	3.2 mA to 10 A
Current Limiter Range			
Maximum Inductive load	100 μ H	500 μ H	1 mH

Voltage/Current Measurement

Effective CMRR: when using DC and AC 50/60 Hz $\pm 0.08\%$, and 1 k Ω unbalanced impedance

	Integration time	
	500 μ s to 10 ms	1 PLC to 100 PLC
Voltage Measurement/ Current Measurement	60 dB	120 dB

NMRR: when AC 50/60 Hz $\pm 0.08\%$

	Integration time	
	500 μ s to 10 ms	1 PLC to 100 PLC
Voltage Measurement/ Current Measurement	0 dB	60 dB

Source/Measurement Functions

DC Source/Measurement:	DC voltage, current source/measurement
Pulse Source/Measurement:	Pulse voltage, current source/measurement LO value of Pulse is the same polarity as the HI value.
DC Sweep Source/ Measurement:	Source/Measurement by Linear, Log, and Random
Pulse Sweep Source/ Measurement:	Source/Measurement by Linear, Log, and Random LO value of Pulse is the same polarity as the HI value.
Sweep mode:	Reverse ON (2 way)/OFF (1 way)
Sweep Repeat Times:	1 to 1000, Infinite
Number of Sweep Maximum Step:	5000 step
Random Sweep Maximum Memory:	5000 data
Measurement Data Buffer Memory:	5000 data
Calculation Functions:	NULL calculation Comparator calculation (HI/GO/LO)
Trigger Method:	Automatic Trigger (DC free run/Pulse repeat) Source/Measurement by external trigger
Output Terminal:	Front; Safety Socket HI OUTPUT, HI SENSE, LO OUTPUT, LO SENSE DRIVING GUARD (For R6243)
Maximum Input Voltage:	R6243; 110 V peak MAX (Between HI-LO, DG-LO) 1 V peak MAX (Between OUTPUT-SENSE) (Between HI-DG) R6244; 500 V peak MAX (Between LO-FRAME) 20 V peak MAX (Between HI-LO) 2 V peak MAX (Between OUTPUT-SENSE) 250 V peak MAX (Between LO-FRAME)
Remote Sensing Voltage:	R6243; ± 0.5 V MAX R6244; ± 1 V MAX Between HI OUTPUT-HI SENSE, Between LO OUTPUT-LO SENSE (The voltage between HI SENSE and LO SENSE shall be within the maximum output voltage.)
Voltage Measurement Input Resistance:	1 G Ω or more
Voltage Measurement Input Leakage Current:	± 2 nA or less
Maximum Guard Offset Voltage:	± 2 mV; Between HI (SENSE) - DG (For R6243)
Maximum Allowable Guard Capacitance:	1000 pF; Between HI (OUTPUT or SENSE) - DG (For R6243)
Maximum Allowable Shield Capacitance:	5000 pF; Between DG-LO (OUTPUT or SENSE) (For R6243)
GPIB Interface:	In accordance with IEEE-std.488-1978 Interface Functions; SH1, AH1, T5, L4, SR1, RL1, PP0, DC1, DT1, C0, E2
Single-wire Signal:	<ul style="list-style-type: none"> •TRIGGER IN •SYNC OUT •COMPLETE OUT/BUSY IN/BUSY OUT •INTERLOCK/OPERATE IN/OPERATE OUT



Rear view of R6243

Setting Time

Minimum Pulse Width: 1 ms

Minimum Step (Repeat) Time: when source range fixed, free run or internal trigger mode, source delay time: 10 μ s

Measurement	Memory Mode	Minimum Step Time
OFF	–	2 ms
ON*	BURST	4 ms
	NORMAL	10 ms
	OFF	

*: Measurement range fixed, integration time: 500 μ s, measure delay time: 300 μ s

Integration time: 500 μ s/1 ms/10 ms/1 PLC/10 PLC/100 PLC
Source Delay Time

Setting Range	Resolution	Setting Accuracy
10 μ s to 600.00 ms	10 μ s	$\pm(0.1\% + 30 \mu\text{s})$
600.1 ms to 6000.0 ms	100 μ s	
6001 ms to 60000 ms	1 ms	

Period (Pulse Interval)

Setting Range	Resolution	Setting Accuracy
2 ms to 600.00 ms	10 μ s	$\pm(0.1\% + 30 \mu\text{s})$
600.1 ms to 6000.0 ms	100 μ s	
6001 ms to 60000 ms	1 ms	

Pulse Width

Setting Range	Resolution	Setting Accuracy
1 ms to 600.00 ms	10 μ s	$\pm(0.1\% + 30 \mu\text{s})$
600.1 ms to 6000.0 ms	100 μ s	
6001 ms to 60000 ms	1 ms	

Measure Delay Time

Setting Range	Resolution	Setting Accuracy
300 μ s to 600.00 ms	10 μ s	$\pm(0.1\% + 30 \mu\text{s})$
600.1 ms to 6000.0 ms	100 μ s	
6001 ms to 60000 ms	1 ms	

Hold Time

Setting Range	Resolution	Setting Accuracy
3 ms to 60000 ms	1 ms	$\pm(2\% + 1 \text{ ms})$

Auto Range Delay Time

Setting Range	Resolution	Setting Accuracy
0 ms to 500 ms	1 ms	$\pm(5\% + 1 \text{ ms})$

General Specifications

Operating environment: Ambient temperature; 0 to 50°C,
Relative humidity; 85% or less (no condensation)
In the case of R6244, the ambient temperature is between 0 to 40°C at the following output range.

$$0 \text{ V} \leq V_o \leq 7 \text{ V}; I_o \geq 3/7 V_o - 10 \text{ [A]}$$
$$-7 \text{ V} \leq V_o \leq 0 \text{ V}; I_o \leq 3/7 V_o + 10 \text{ [A]}$$

V_o ; Output Voltage [V]
 I_o ; Output Current [A]

Storage environment: Ambient temperature; -25 to +70°C,
Relative humidity; 85% or less (no condensation)

Warmup :

60min. or more
(until the specified accuracy is reached)

Display:

5 x 7 dot matrix fluorescent character display

Power supply:

AC 100 V/120 V/220 V/240 V (switchable by user)

Option No.	Standard	OPT. 32	OPT. 42	OPT. 44
Power source voltage	100 V	120 V	220 V	240 V

Line frequency:

50 Hz/60 Hz

Power consumption:

R6243; 340 VA or less
R6244; 400 VA or less

Dimensions:

R6243; Approx. 212 (W) x 177 (H) x 450 (D) mm
R6244; Approx. 212 (W) x 177 (H) x 500 (D) mm

Mass:

15 kg or less

Standard accessories

Power cable	A01402
Input/output cable (Red and black safety cable, 1 m)	A01044

Accessories (Optional)

Test fixture	R12701A
Test lead (1m)	A01041
Input/output cable (Red and black safety cable, 1 m)	A01044
Alligator clip adaptor	A08532
Banana chip adaptor	A08531
Rack mounting set (EIA, Twin, with Front handle)	A02710
Rack mounting set (JIS, Twin, with Front handle)	A02711
Rack mounting set (EIA, Twin, without Front handle)	A02720
Rack mounting set (JIS, Twin, without Front handle)	A02721
Rack mounting set (EIA, Single)	A02469
Rack mounting set (JIS, Single)	A02269
Side joint kit (4U, Twin)	A02641
Sliding rail set	A02615

For R6243

Input/output cable (4-wire banana-Alligator clip, 1m)	A01023-100
Input/output cable (4-wire banana-banana, 1m)	A01038-100

For R6244

Input/output cable (4-wire banana-banana, 0.5m)	A01047-01
Input/output cable (4-wire banana-banana, 1m)	A01047-02
Input/output cable (4-wire banana-banana, 1.5m)	A01047-03
Input/output cable (4-wire banana-banana, 2m)	A01047-04



NOTE: The R6244 is scheduled to receive CE Mark approvals after Jan. 2003.

Please be sure to read the product manual thoroughly before using the products.
Specifications may change without notification.

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