ADCMT®

DC voltage current source/monitor suitable for evaluating high-voltage semiconductors and LED luminaires

New

- **Wide ranging source and measurement**
  Voltage: -15 V to +250 V   Current: 0 to ±320 mA

- **Source resolution of 100 µV/100 pA**

- **5½-digit display (±320999) with measurement resolution of 10 µV/10 pA**

- **Basic source and measurement accuracy of ±0.02%**

- **Pulse measurement with minimum pulse width of 50 µs and resolution of 1 µs**

- **Sink-enabled bipolar output**

- **GPIB (6247G), RS232 (6247C) and USB (6247G/6247C)**

RS232	USB		GPIB	USB
6247C			**6247G**	

http://www.adcmt-e.com

Source Measure Unit Capable of Testing High-Voltage Devices
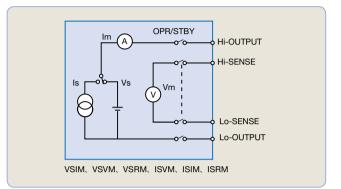# Output Voltage Up to +250 V and Output Current Up to ±320 mA

The 6247C/6247G is a DC voltage current source/monitor designed for evaluating high voltage semiconductors and LED luminaires that demand high efficiency and low power consumption, capable of outputting voltage up to +250 V and current up to ±320 mA. It provides high accuracy of ± 0.02% with 4½-digit display for source and 5½-digit display for measurement. The source resolution of 100 µV and the measurement resolution of 10 µV in the 5 V range enables high-precision evaluation at +3 V to +5 V necessary for LEDs or lithium-ion batteries.

In addition, the 6247C/6247G is equipped with the various types of sweep functions such as linear, fixed, random and two slope linear sweep functions, the pulse measurement function with the minimum pulse width of 50 µs, the micro voltage and current measurement function with the minimum resolution of 10 µV or 10 pA, and the suspend function that controls the optimized output status. By using these functions, the 6247C/6247G can be widely used for evaluating or testing semiconductor and other electronic components in R&D fields and production lines.
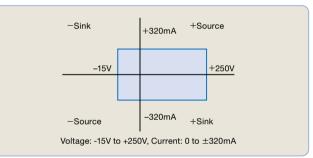
RS232 and USB are installed as standard interface for the 6247C and GPIB and USB for the 6247G, allowing easy construction of automated production lines.
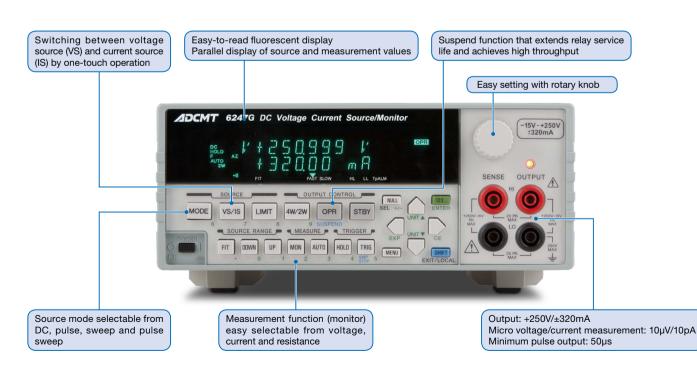
Source and Measurement Functions

Voltage source, current source, voltage measurement, current measurement and resistance measurement are available by specifying the source and measurement functions.

VSIM、VSVM、VSRM、ISVM、ISIM、ISRM

Output Range

Voltage: -15V to +250V, Current: 0 to ±320mA

Switching between voltage source (VS) and current source (IS) by one-touch operation

Easy-to-read fluorescent display
Parallel display of source and measurement values

Suspend function that extends relay service life and achieves high throughput

Easy setting with rotary knob

Source mode selectable from DC, pulse, sweep and pulse sweep

Measurement function (monitor) easy selectable from voltage, current and resistance

Output: +250V/±320mA
Micro voltage/current measurement: 10µV/10pA
Minimum pulse output: 50µs

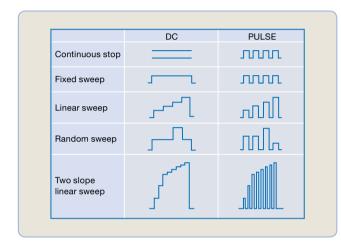# High Voltage I-V Characteristics

Voltage and Current Source Mode

There are four source modes; DC, pulse, DC sweep, pulse sweep. Then, the sweep modes are classified into four sweep types: fixed sweep, linear sweep, random sweep (any type of waveform generation by user's programming), two slope linear sweep (linear sweep with step value switching).

The minimum pulse width is 50 μs.

The minimum cycle is 2 ms, or 500 μs without measurement.

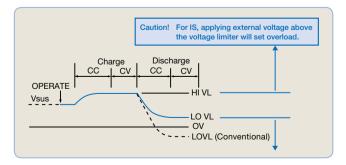|	DC	PULSE
Continuous stop		
Fixed sweep		
Linear sweep		
Random sweep		
Two slope linear sweep		

HI/LO Limiters Separate Setting

In voltage or current source, the HI/LO limiter settings are very important. For current source, the limiter voltage must be higher than the applied voltage.

When voltage higher than the limiter voltage is applied from the outside, the instrument detects overload and sets standby. When a capacitor is discharged after being charged at a constant current with the positive and negative limiters being set to the same value, overload occurs if the limiter voltage is lowered. In addition, it is discharged down to negative voltage when applying reverse polarity current.

However, the 6247C/6247G has a function that can set the HI and LO limiters individually. Furthermore, for the voltage-limiter, both HI and LO limiters can be set homo-polar. This prevents a capacitor or a battery from being over-discharged. Also, it is suitable for evaluating devices such as LDs that are used at a constant current and do not tolerate reverse voltage application.

Caution! For IS, applying external voltage above the voltage limiter will set overload.

OPERATE
Vsus
Charge CC CV
Discharge CC CV
HI VL
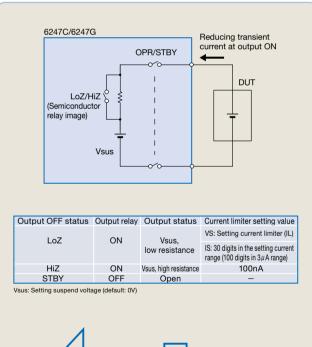LO VL
OV
LOVL (Conventional)

Suspend Function

The 6247C/6247G can select from three output OFF statuses; STBY (output relay OFF), HiZ (output relay ON and high resistance), and LoZ (output relay ON and low resistance). Using this function can omit unnecessary relay ON/OFF operations, which extends the relay lifetime and improves the system throughout.

In addition, the setting of a suspend voltage (voltage in HiZ and LoZ status) can prevent transient current from being generated when connecting voltage sourcing devices such as batteries.

When a conventional generator or electronic load is connected with a battery, the output voltage is 0V, and then the setting current starts flowing. In this case, the moment that it is connected, transient current sink occurs, causing unnecessary battery discharge.

On the other hand, by setting the suspend voltage, the 6247C/6247G is connected in high-impedance state at the specified voltage and then the setting current flows. This prevents unnecessary discharge at the connection to the battery.

For the 6247C/6247G, the source modes can be switched in such suspend status, which improves the throughput. (Continuous testing is possible without disconnecting DUTs.)

6247C/6247G
OPR/STBY
Reducing transient current at output ON
DUT
LoZ/HiZ (Semiconductor relay image)
Vsus

Output OFF status	Output relay	Output status	Current limiter setting value
LoZ	ON	Vsus, low resistance	VS: Setting current limiter (IL)
			IS: 30 digits in the setting current range (100 digits in 3μA range)
HiZ	ON	Vsus, high resistance	100nA
STBY	OFF	Open	—

Vsus: Setting suspend voltage (default: 0V)

SUS   SWEEP   SUS   PULSE   SUS   DC   SUS   SWEEP   SUS

Wide ranging applications for high-voltage semiconductors and LEDs by pulse application test with low power consumption

Current Application Response

LED evaluation is done by ISVM (current source voltage measurement).
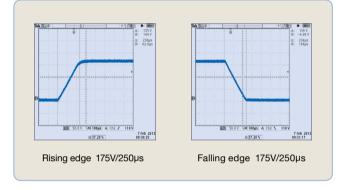
When constant current is applied to a LED between 0 A and +IS, the output current becomes the setting current at the rising edge, but 0 A at the falling edge and the response time is very slow to discharge the device.

To avoid this problem, current is applied between -IS and +IS.

At this time, +VL is set to the forward voltage or higher and -VL to 0 V or minus several V to prevent reverse voltage application.

The response when fifty white LEDs are connected in series is as follows:
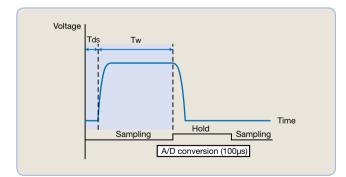
+IS = +30 mA, -IS = -30 mA, +VL = +200 V, -VL = -5 V

Rising edge 175V/250µs	Falling edge 175V/250µs

Sample Hold Measurement

Sample hold measurement is available in the pulse mode and the pulse sweep mode. Measurement holds an input signal immediately before pulse falling edge, and A/D conversion is implemented for integration time of 100 µs.

This function enables precise values to be measured without setting the measurement delay time.
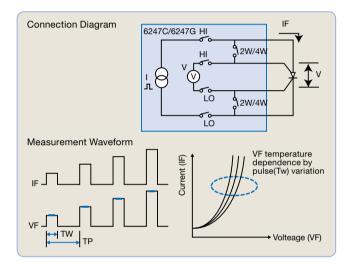

Diode Temperature Dependence Evaluation

In I-V characteristic test on devices that generate heat when current flows, applying pulse current is effective for avoiding the influence of the self-heating.

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

● Pulse sweep function
● Current setting range: 0 mA to ±320 mA
● Voltage measurement resolution: 10 µA
● Pulse measurement with minimum pulse width of 50 µs and minimum cycle of 2 ms
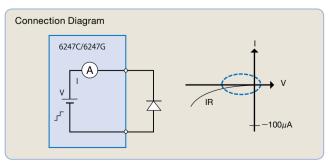

Diode Leak Current Measurement

The 6247C/6247G is 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 up to 10 pA can be measured by applying reverse voltage to diodes by VSIM.

Also, automatic PASS/FAIL judgment is available by using comparison operation of the measurement calculating function.

● Sweep function
● Maximum setting range: -15 V to +250 V/±320 mA
● Current measurement resolution: 10 pA
● Measurement calculating function
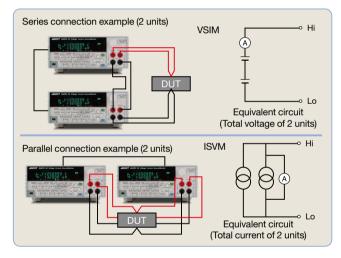
Wide Use of DC Voltage Current

Higher Voltage and Larger Current Device Testing

As the 6247C/6247G adopts floating bipolar output, the voltage capacity or current capacity can be increased by connecting more than two units in series or in parallel. Accordingly, it is capable of testing devices such as semiconductors that need higher voltage or larger capacity.

For example, connecting two units in series outputs up to +500 V/±320 mA, or two units in parallel up to ±640 mA/+250 V.

Similarly, the output level that you wish is available by connecting two units in series or more than two units in parallel as shown below:

		Number of units connected in series	
		1	2
Number of units connected in parallel	1	+250V／320mA	+500V／320mA
	2	+250V／640mA	+500V／640mA
	3	+250V／960mA	+500V／960mA
	⋮	⋮	⋮

Series connection example (2 units)

VSIM

Equivalent circuit
(Total voltage of 2 units)

Parallel connection example (2 units)

ISVM

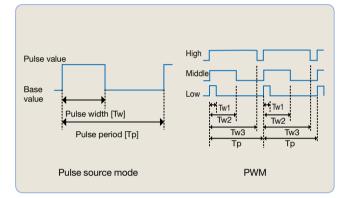Equivalent circuit
(Total current of 2 units)

LED Pulse Width Modulation Brightness Evaluation

To control the LED brightness, generally the pulse width modulation (PWM) method is used.

PWM requires the constant pulse current, the pulse width and the pulse period need to be varied.

This can be easily done by using the pulse source mode of the 6247C/6247G.
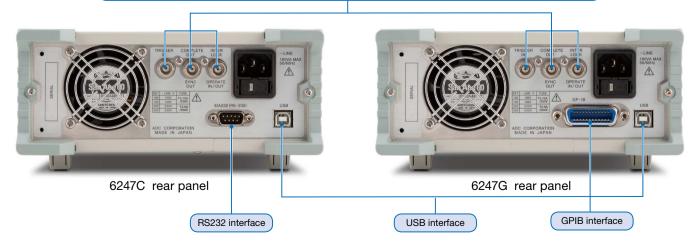
- Pulse source mode
- Maximum setting range: -15 V to +250 V/±320 mA
- Pulse width: 50 µs to 59998 ms
- Pulse period: 500 µs to 60000 ms

Pulse value

Base value

Pulse width [Tw]

Pulse period [Tp]

Pulse source mode

High

Middle

Low

Tw1

Tw2

Tw3

Tp

PWM

USB Interface

The 6247C/6247G is equipped with a USB interface as standard, allowing easy data transmission from a PC. In addition to the software to capture measurement data onto Excel sheets, the USB driver and the sample software are available from our website.

TRIGGER IN/SYNC OUT signal to perform synchronous operation of multi-units or synchronous control on external measuring instruments and to output comparison operation results, and INTERLOCK signal to prevent malfunction

6247C rear panel

6247G rear panel

RS232 interface

USB interface

GPIB interface

Specifications

All accuracy specifications are guaranteed for one year at a temperature of 23 ±5°C and a relative humidity of 85% or less.

Voltage source/measurement range:

Range	Source range	Setting resolution	Measurement range	Measurement resolution
5V	-1.0000 to +5.0000V	100μV	-1.00999 to +5.00999V	10μV
50V	-10.000 to +50.000V	1mV	-10.0999 to +50.0999V	100μV
250V	-15.00 to +250.00V	10mV	-15.099 to +250.999V	1mV

Current source/measurement range:

Range	Source range	Setting resolution	Measurement range	Measurement resolution
3μA	0 to ±3.2000μA	100pA	0 to ±3.20999μA	10pA
30μA	0 to ±32.000μA	1nA	0 to ±32.0999μA	100pA
300μA	0 to ±320.00μA	10nA	0 to ±320.999μA	1nA
3mA	0 to ±3.2000mA	100nA	0 to ±3.20999mA	10nA
30mA	0 to ±32.000mA	1μA	0 to ±32.0999mA	100nA
300mA	0 to ±320.00mA	10μA	0 to ±320.999mA	1μA

However, the measurement resolution with integration time of 100μs, 500μs and S/H (Sample Hold) will be as follows:

Integration time	100μs	500μs	S/H (100μs)
Measurement resolution (digits)	10	2	10

Resistance measurement range:

Range	Measurement range	Measurement resolution
Determined by voltage range/current range calculations	0Ω to 125GΩ	Minimum 30μΩ

Voltage limiter (compliance) range:

Setting range	Setting resolution[1]
-1.000V to +5.000V	1mV
-10.00V to +50.00V	10mV
-15.0V to +250.0V	100mV

Current limiter (compliance) range:

Setting range	Setting resolution[1]
10nA to 3.2μA	1nA
3.201μA to 32μA	10nA
32.01μA to 320μA	100nA
320.1μA to 3.2mA	1μA
3.201mA to 32mA	10μA
32.01mA to 320mA	100μA

[1]: Where, (Hi limiter value - Lo limiter value) ≥ 60 digits (200 digits in the 3μA range)

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

Voltage source:

Range	Accuracy	1-day stability	Temperature coefficient
	±(% of setting+V)		±(ppm of setting+V)/°C
5V	0.02 +500μV	0.01+200μV	20 +40μV
50V	0.02 +5mV	0.01+2mV	20 +400μV
250V	0.025 +50mV	0.01+20mV	20 +4mV

Voltage limiter:

Range	Accuracy	1-day stability	Temperature coefficient
	±(% of setting+V)		±(ppm of setting+V)/°C
5V	0.05+3mV	0.01+1mV	50 +300μV
50V	0.05+30mV	0.01+10mV	50 +3mV
250V	0.05+300mV	0.01+100mV	50 +30mV

Voltage limiter additional error: When Hi limiter is set to a negative value and Lo limiter is set to a positive value, an error of ±0.1% of setting is added.

Current source:

Range	Accuracy	1-day stability	Temperature coefficient
	±(% of setting+A+A×Vo/1V)		±(ppm of setting+A+A×Vo/1V)/°C
3μA	0.03+5nA+30pA	0.01+3nA+10pA	30+500pA+1pA
30μA	0.03+15nA+300pA	0.01+8nA+100pA	30+1.5nA+10pA
300μA	0.03+150nA+3nA	0.01+80nA+1nA	30+15nA+100pA
3mA	0.03+1.5μA+30nA	0.01+800nA+10nA	30+150nA+1nA
30mA	0.03+15μA+300nA	0.01+8μA+100nA	30+1.5μA+10nA
300mA	0.045+150μA+3μA	0.015+80μA+1μA	45+15μA+100nA

Current limiter:

Range	Accuracy	1-day stability	Temperature coefficient
	±(% of setting+A+A×Vo/1V)		±(ppm of setting+A+A×Vo/1V)/°C
3μA	0.045+8nA+30pA	0.01+5nA+10pA	40+1nA+1pA
30μA	0.045+35nA+300pA	0.01+20nA+100pA	40+3.5nA+10pA
300μA	0.045+350nA+3nA	0.01+100nA+1nA	40+35nA+100pA
3mA	0.045+3.5μA+30nA	0.01+1μA+10nA	40+350nA+1nA
30mA	0.045+35μA+300nA	0.01+10μA+100nA	40+3.5μA+10nA
300mA	0.055+350μA+3μA	0.015+100μA+1μA	45+35μA+100nA

Vo: Compliance voltage (-15V to +250V)

Voltage measurement: (Auto zero: ON, integration time: 1PLC to 200ms)

Range	Accuracy	1-day stability	Temperature coefficient
	±(% of reading+V)		±(ppm of reading+V)/°C
5V	0.02 +120μV	0.008 +50μV	20 +15μV
50V	0.02 +1.2mV	0.008 +500μV	20 +150μV
250V	0.02 +10mV	0.008 + 8mV	20 + 1mV

Current measurement: (Auto zero: ON, integration time: 1PLC to 200ms)

Range	Accuracy	1-day stability	Temperature coefficient
	±(% of reading+A+A×Vo/1V)		±(ppm of reading+A+A×Vo/1V)/°C
3μA	0.03+4nA+30pA	0.01+2.5nA+10pA	30+450pA+1pA
30μA	0.03+12nA+300pA	0.01+7nA+100pA	30+1.5nA+10pA
300μA	0.03+120nA+3nA	0.01+70nA+1nA	30+15nA+100pA
3mA	0.03+1.2μA+30nA	0.01+700nA+10nA	30+150nA+1nA
30mA	0.03+12μA+300nA	0.01+7μA+100nA	30+1.5μA+10nA
300mA	0.045+120μA+3μA	0.015+70μA+1μA	30+15μA+100nA

Resistance measurement:(Auto zero: ON, integration time: 1PLC to 200ms)

Condition	Accuracy
	±(%of reading) ±(digits+digits+digits)
Voltage source	Reading item: (Voltage source setting item + Current measurement reading item) Full-scale item:(Voltage source full-scale item digit value + current measurement full-scale item digit value + CMV item digit value)[2]
Current source	Reading item: (Current source setting item + Voltage measurement reading item) Full-scale item:(Current source full-scale item digit value + Voltage measurement full-scale item digit value + CMV item digit value)[2]

Vo: Compliance voltage (-15V to +250V)

[2]: CMV item = (A × Vo/1V); source or measurement current × source or measurement voltage/1V digit value

The full-scale item tolerances listed below are added to the integration time 100μs to 10ms, S/H measurement accuracy and 1-day stability

Measurement range		Integration time		Unit: digits (at 5½ digit display)			
		10ms	5ms	1ms	500μs	100μs	S/H
Voltage measurement	5V	5	15	20	30	100	120
	50V	5	15	20	30	100	120
	250V	5	15	20	30	100	120
Current measurement	3μA	600	1000	1500	2000	2000	3000
	30μA	200	300	300	300	500	2000
	300μA	40	50	60	80	200	1500
	3mA	40	50	60	80	200	500
	30mA	40	50	60	80	200	300
	300mA	40	50	60	60	200	300

S/H: Measurement in the sample hold mode (integration time: 100μs)

Source linearity: ±3 digits or less
Maximum output current: -15V to +250V; ±320mA
Maximum compliance voltage: Up to ±320mA; -15V to +250V

Output noise: For voltage source, within the range from no load to the maximum load [Vp-p] For current source, at the following load [Ap-p]

Voltage source:

Range	Load resistance	Low frequency noise		High frequency noise
		DC to 100Hz	DC to 10kHz	DC to 20MHz
5V	—	200μV	400μV	10mV
50V	—	300μV	1mV	10mV
250V	—	500μV	5mV	10mV

Current source:

| Range | Load resistance | Low frequency noise | | High frequency noise |
		DC to 100Hz	DC to 10kHz	DC to 20MHz
3µA	10kΩ	10nA	60nA	800nA
30µA	10kΩ	10nA	60nA	800nA
300µA	10kΩ	50nA	150nA	800nA
3mA	1kΩ	500nA	2µA	10µA
30mA	1kΩ	4µA	10µA	20µA
300mA	1kΩ	40µA	60µA	100µA

Switching noise:

		Typical value [p-p]	Load resistance
Output ON/OFF noise	Voltage source	1V	At 100kΩ
	Current source	1V	At 100kΩ
Range switching noise	Voltage source	100mV	—
	Voltage limiter	100mV*3	—
	Voltage measurement	100mV*3	—
	Current source	100digits+100mV*4	—
	Current measurement		
	Current limiter		
Power OFF noise		1V	At 100kΩ

*3: The Limiter is inactive. While the limiter is active, it is the same as the current source range switching noise.
*4: "digits" indicates current source 4½ digit values.

Settling time: Time to reach the final value ±0.1% at pure resistance load and load capacity of 2.5pF and with compliance set to full scale
Voltage source: at load where the output current is 20% or less of the setting limiter in the 250V range (FAST: 600 µs, SLOW: 2.5ms at full load)

| (Typical value) | Source range | Limiter range | Output response | |
			FAST	SLOW
Voltage source	5V	3mA to 300mA	300µs	2.2ms
	50V			
	250V			
Current source Output voltage: 5V	3mA	250V	120µs	
	30mA			
	300mA			
Current Source Output voltage: 250V	3mA	250V	800µs	4.5ms
	30mA			
	300mA			

Over shoot: ±5% or less under pure resistance load and at the standard cable end(3µA, 30µA and 300µA ranges excluded)
Line regulation: ±0.003% of range or less
Load regulation: Voltage source: ±0.003% of range or less (at 4-wire connection under the maximum load)
Current source: Depending on the accuracy CMV (A × Vo/1V)
Output resistance: At 4-wire connection (Output cable not included)
Maximum load capacitance: Maximum load capacitance that does not generate oscillation in voltage source or voltage limiter status

| Output resistance (Ω) | | | Maximum load capacitance |
Current range	Voltage source	Current source	
3µA	3Ω or less	10GΩ or higher	1µF
30µA	500mΩ or less	1000MΩ or higher	1µF
300µA	100mΩ or less	1000MΩ or higher	1µF
3mA	10mΩ or less	100MΩ or higher	100µF
30mA	10mΩ or less	10MΩ or higher	100µF
300mA	10mΩ or less	1MΩ or higher	2000µF

Supplied cable resistance: 100mΩ or less
Maximum inductive load: Maximum inductive load that does not generate oscillation in current source or voltage limiter status

Current source range/ current limiter range	Response	3µA, 30µA	300µA	3mA to 300mA
Maximum inductive load	FAST	100µH	200µH	1mH
	SLOW	500µH	1mH	

Effective CMRR: At unbalanced impedance 1kΩ
In DC and AC 50/60 Hz ± 0.08%

| | Integration time | |
	100µs to 10ms	1PLC to 200ms
Voltage source/current measurement	35dB	95dB
Current source/voltage measurement	35dB	95dB

NMRR: At AC 50/60 Hz ± 0.08%

| | Integration time | |
	100µs to 10ms	1PLC to 200ms
Voltage source/current measurement	0dB	60dB

Source and measurement function

DC source and measurement: Source and measurement of DC voltage and current
Pulse source and measurement: Source and measurement of pulse voltage and current (However, measurement auto range in pulse source is impossible)
DC sweep source and measurement: Source and measurement by Linear, Two slope linear, Random and Fixed levels
Pulse sweep source and measurement: Source and measurement by Linear, Two slope linear, Random and Fixed levels(However, measurement auto range in pulse source is impossible)
Integration time: 9 types available: 100µs, 500µs, 1ms, 5ms, 10ms, 1PLC, 100ms, 200ms and S/H
S/H: Sample hold (integration time: 100µs) measurement (Enabled only in the pulse source and pulse sweep source modes.)
(PLC: Power Line Cycle 50Hz: 20ms, 60Hz: 16.66ms)
Sweep mode: Reverse ON (round) / OFF (one way)
Sweep repeat count: 1 to 1000 times or infinite
Maximum number of sweep steps: 8000 steps
Maximum random sweep memory: 8000 data
Measurement data memory: 8000 data
Measurement auto range: Available only in VSIM or ISVM
Measurement function link mode: Links the source function to the measurement function. (VSIM or ISVM)
ON/OFF available
Limiter: The HI and LO limiters can be set individually. (However, current limiters of the same polarity are not allowed.)
Calculation function: NULL calculation
Comparator calculation (HI, GO, or LO)
Scaling calculation
MAX, MIN, AVE, TOTAL calculation
Trigger style: Auto trigger, External trigger
Output terminal: Front; Safety socket
HI OUTPUT, HI SENSE, LO OUTPUT, and LO SENSE
Maximum input: +250V/-15V peak Max (between HI-LO)
2V peak Max (between OUTPUT and SENSE)
250V Max (between LO and chassis)
Maximum remote sensing voltage: ±1V Max; HI OUTPUT - HI SENSE, LO OUTPUT - LO SENSE
(The voltage between HI SENSE and LO SENSE must be within the maximum output voltage range.)
Voltage measurement input resistance: 10GΩ or higher
Voltage measurement input leak current: ±100pA or lower

Interface Function
GPIB: **(6247G only)**
Compliant with IEEE-488.2-1987
Interface function; SH1, AH1, T5, L4, SR1, RL1, PP0, DC1, DT1, C0, E2
Connector; Amphenol 24 pin
RS-232: **(6247C only)**
Compliant with EIA232C (RS-232)
Baud rate; 19200, 9600, 4800, 2400, 1200, 600, 300
Parity; even, odd and none
Number of data bits; 7 bits, 8 bits
Number of stop bits; 1 bit, 2 bits
Connector; Dsub 9 pin
USB interface: USB 2.0 Full-speed
Connector; Type B
External control signal: TRIGGER IN, INTERLOCK, OPERATE IN, OPERATE OUT,SYNC OUT
Connector; BNC

Setting Time

Minimum pulse width: 50μs
Minimum step (repeat) time: Under fixed source/measurement range, integration time of 100μs, the minimum measurement or source delay time, calculation function OFF, and voltage/current measurement

Measurement	Memory mode	Minimum step time
OFF	—	0.5ms
ON	BURST	2ms
	NORMAL	10ms
	OFF	

Source delay time:

Setting range	Resolution*5	Setting accuracy
0.030ms to 60.000ms	1μs	
60.01ms to 600.00ms	10μs	±(0.1%+10μs)
600.1ms to 6000.0ms	100μs	
6001ms to 59998 ms	1ms	

Period (pulse cycle):

Setting range	Resolution*5	Setting accuracy
0.500ms to 60.000ms	1μs	
60.01ms to 600.00ms	10μs	±(0.1%+10μs)
600.1ms to 6000.0ms	100μs	
6001ms to 60000 ms	1ms	

Pulse width:

Setting range	Resolution*5	Setting accuracy
0.050ms to 60.000ms	1μs	
60.01ms to 600.00ms	10μs	±(0.1%+10μs)
600.1ms to 6000.0ms	100μs	
6001ms to 59998 ms	1ms	

Measurement delay time:

Setting range	Resolution*5	Setting accuracy
0.050ms to 60.000ms	1μs	
60.01ms to 600.00ms	10μs	±(0.1%+10μs)
600.1ms to 6000.0ms	100μs	
6001 ms to 59998 ms	1ms	

*5: The setting resolution is determined by the period time resolution.

Hold time:

Setting range	Resolution	Setting accuracy
1ms to 60000 ms	1ms	±(2% + 3ms)

Auto range delay time:

Setting range	Resolution	Setting accuracy
0ms to 5000 ms	1ms	±(2% + 3ms)

General Specifications

Operating environment: Ambient temperature: 0°Cto +50°C
Relative humidity: 85% or less, no condensation
Storage environment: Ambient temperature: -25°C to +70°C
Relative humidity: 85% or less, no condensation
Warm-up time: 60 minutes or more
Display: 16 segments x 12 digits vacuum fluorescent display
Power supply: AC power supply 100V/120V/220V/240V (User selectable)

Option number	Standard	OPT. 32	OPT. 42	OPT. 44
Power voltage	100V	120V	220V	240V

Specify the option when ordering.
Use a power cable and a fuse that are compliant with the safety standard when changing the power supply voltage.

Line frequency: 50Hz/60Hz
Power consumption: 160VA or less
Dimensions: Approx. 212 (W) x 88 (H) x 450 (D) mm
Mass: 7.3kg or less
Safety: Compliant with IEC61010-1 Ed.3
EMI: EN61326-1 class A

Supplied accessories:

Model	Name	Quantity
A01402	Power cable	1
A01044	Input/output cable (red and black safety cable 1m)	1
A08532	Alligator clip adapter (red and black)	1
A08531	Banana adapter (red and black)	1

Optional accessories:

Model	Name
12701A	Test fixture
A01041	Input cable (1m)
A01044	Input/output cable (red and black safety cable 1m)
A08532	Alligator clip adapter (red and black)
A08531	Banana adapter (red and black)
A01047-01	Input/output cable (banana-banana 4-wire shielding 0.5m)
A01047-02	Input/output cable (banana-banana 4-wire shielding 1m)
A01047-03	Input/output cable (banana-banana 4-wire shielding 1.5m)
A01047-04	Input/output cable (banana-banana 4-wire shielding 2m)
A01036-1500	BNC-BNC cable (1.5m)
A02263	Rack mount set (JIS 2U half)
A02264	Rack mount set (JIS 2U half twin)
A02463	Rack mount set (EIA 2U half)
A02464	Rack mount set (EIA 2U half twin)
A02039	Panel mount set (2U half)
A02040	Panel mount set (2U half twin)

Note: When mounting the instrument on a rack, install a shelf plate or support bar as necessary.

- Please read through the operation manual carefully before using the products.
- All specifications are subject to change without notice.

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