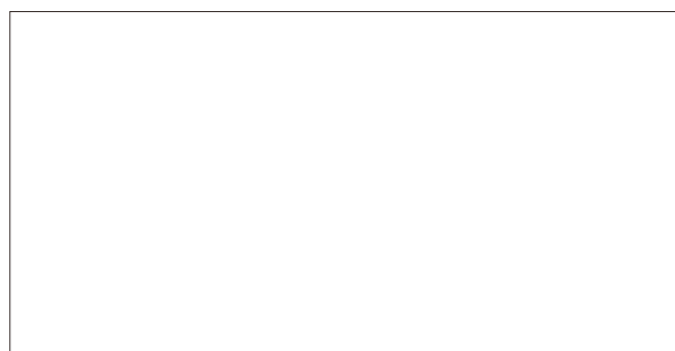




Reliability Evaluation Systems Product Catalog



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*The specifications and design are subject to change without notice.

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IMV CORPORATION

Reliability Evaluation Systems

IMV's insulation degradation tester can be used with only one high side / low side.

What is a reliability evaluation system?

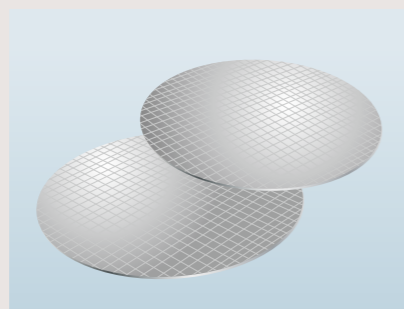
In recent years, product quality has been increasingly improved. The "Reliability Evaluation System" is a system to evaluate product functions and operations and remove defects at the development stage to improve product reliability.

IMV offers highly reliable and repeatable tests, including the MIG series, a migration tester with one channel / one power supply / one measurement circuit method, which was adopted for the first time in the industry.

▶ Example of use



Circuit board



Semiconductor



Electric car

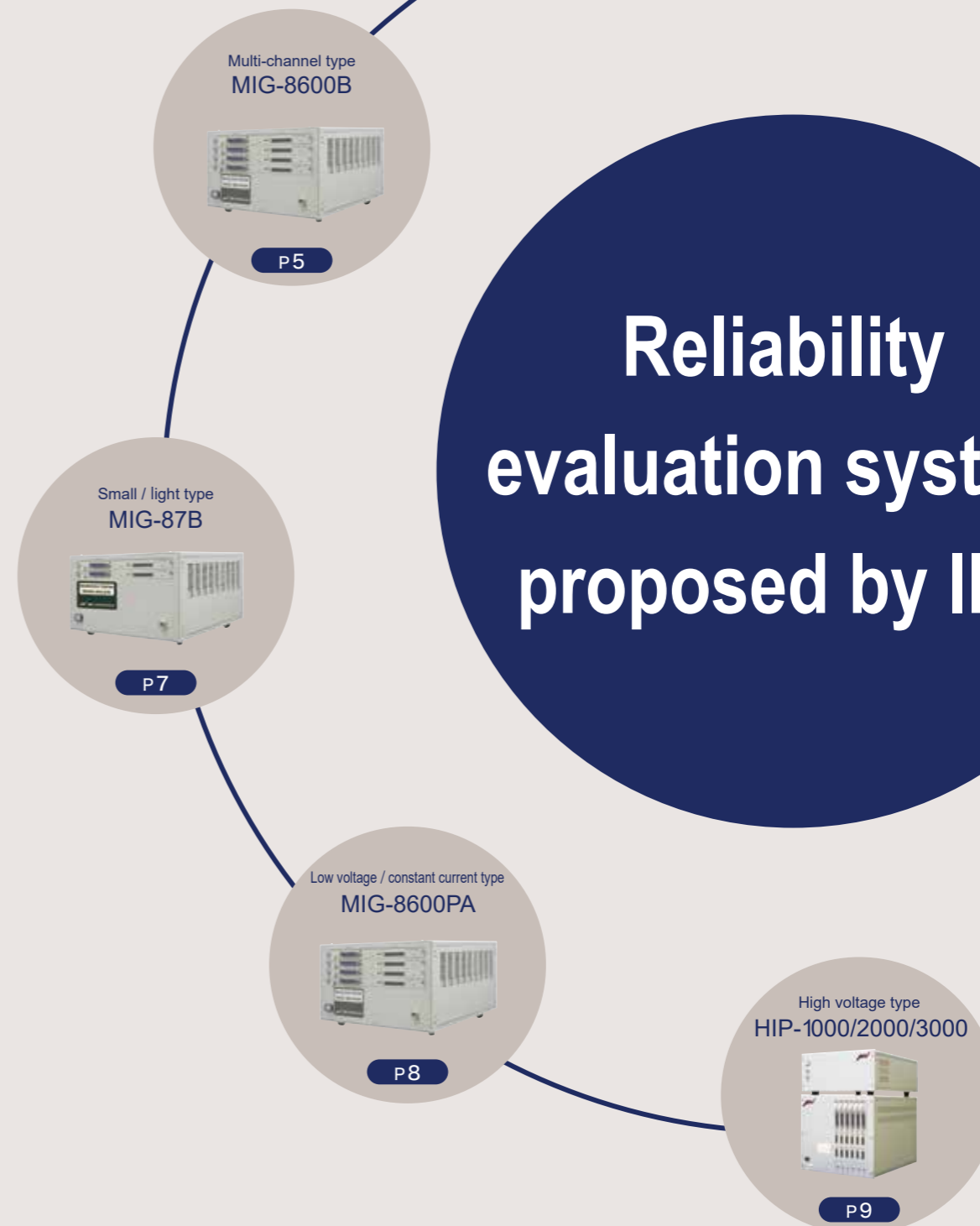


Electronic materials



Lithium ion battery

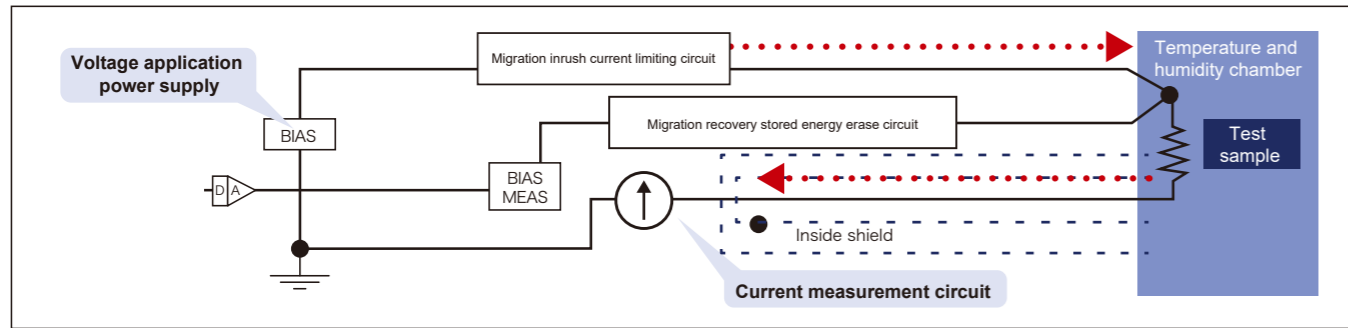
Reliability evaluation system proposed by IMV



1 One channel / One power supply / One measurement circuit

The MIG series has an applied power supply and measurement circuit separately for each channel, so even if migration occurs on one channel, the other channels are not affected at all.

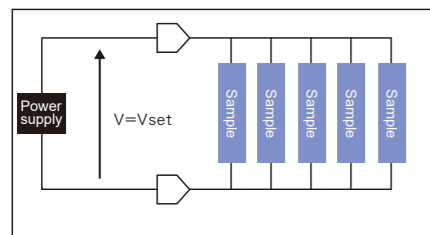
IMV first adopted in the industry!



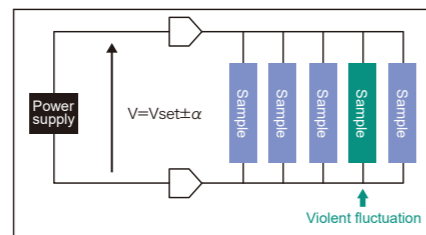
1channel block diagram

Multi-channel / 1 power supply diagram

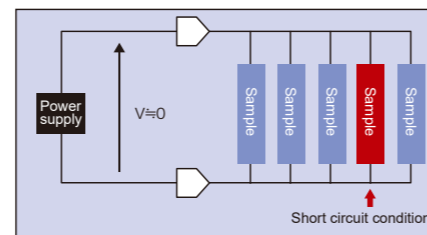
In order to prevent shorting of the sample, a limiting resistor may be inserted between the sample and the tester. However, it is necessary to insert a limiting resistor corresponding to the applied voltage.



Under normal conditions, the set voltage (Vset) is applied to each sample.



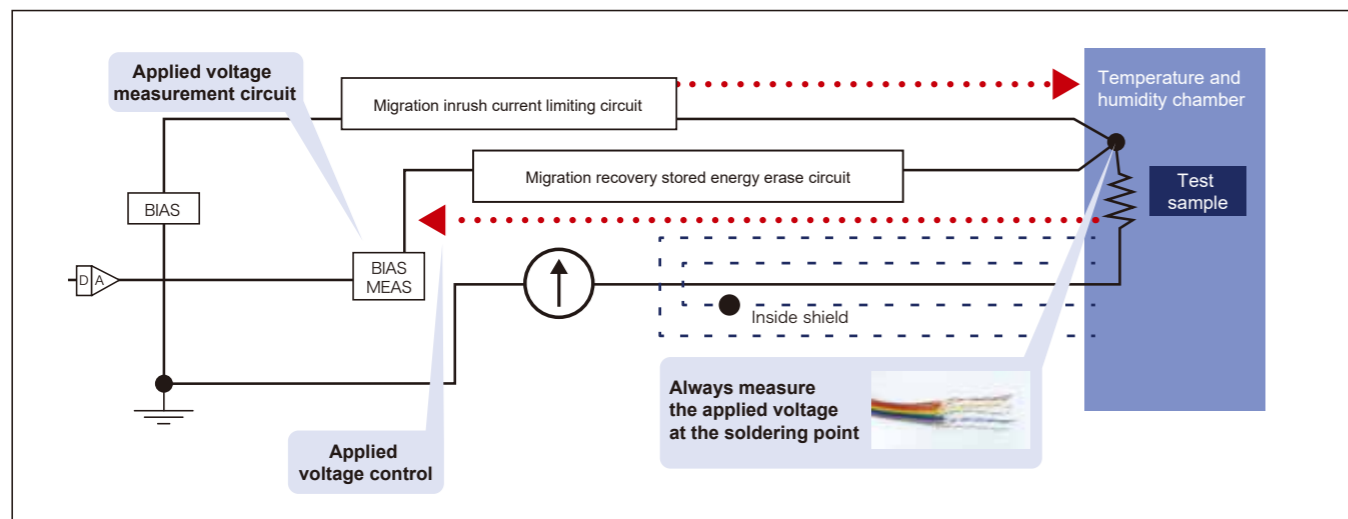
If the resistance of a single sample changes sharply, the overall bias voltage will change accordingly. It is thought that the growth of migration phenomena of other samples is adversely affected.



When one sample is shorted, there is a risk that the applied voltage of all samples may drop, and at this point the evaluation of all samples may be interrupted. There is no point in evaluating multiple samples at the same time.

2 Monitoring / control of applied voltage

The applied voltage at each soldering point is constantly monitored for each channel and controlled as set.



1channel block diagram

3 Inrush current limiting circuit

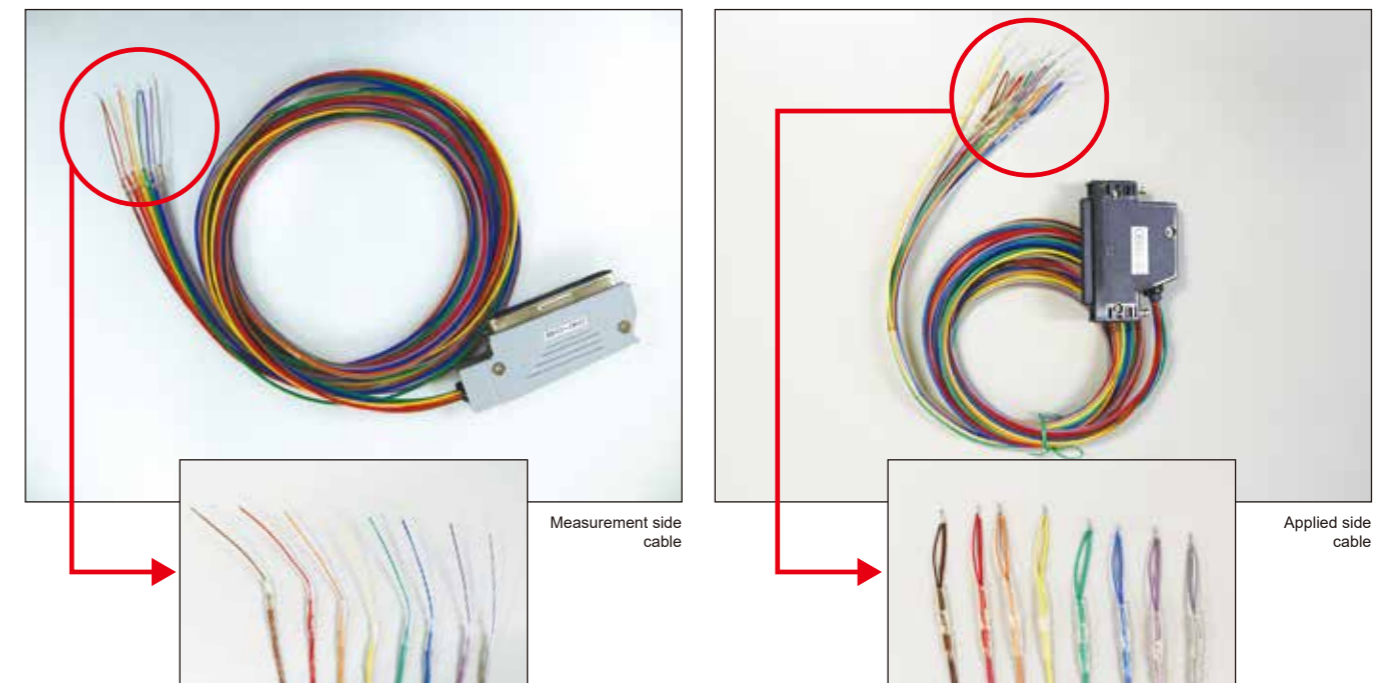
Due to migration, excessive current may flow to the sample and cause the following adverse effects.

- ① Scatters and annihilates the dendrite itself, making observation and analysis impossible
- ② Carbonize the surface of the sample to inhibit the subsequent migration

All IMV's MIG series have inrush current limiting circuits to protect samples from adverse effects, so it is safe.

Dual structure active guard cable

By using a dual structure active guard cable, it cuts surrounding noise and commercial hum. This significantly improves the accuracy of migration tests that measure weak current.



Dual structure active guard

Coaxial cables generally used for measurement can be problematic when measuring minute currents.

- ① Leakage current between measurement line and shield line
- ② Influence of the capacitance between the resistance of the measurement line and the shield line on the measurement of the time constant

We use double shielded wire for the measurement cable and also have an active guard function to avoid this effect as much as possible. In this structure, by controlling the inner shield wire to be at the same potential as the measurement line, it is possible to cancel the influence of resistance and capacitance between the measurement line and the inner shield wire. (There is no potential difference, so no current flows, and there is no need to charge the capacity component.) This can eliminate the influence on the measurement of above ① ②.

MIG-8600B

Multi-channel type

IMV's Best Selling Machine

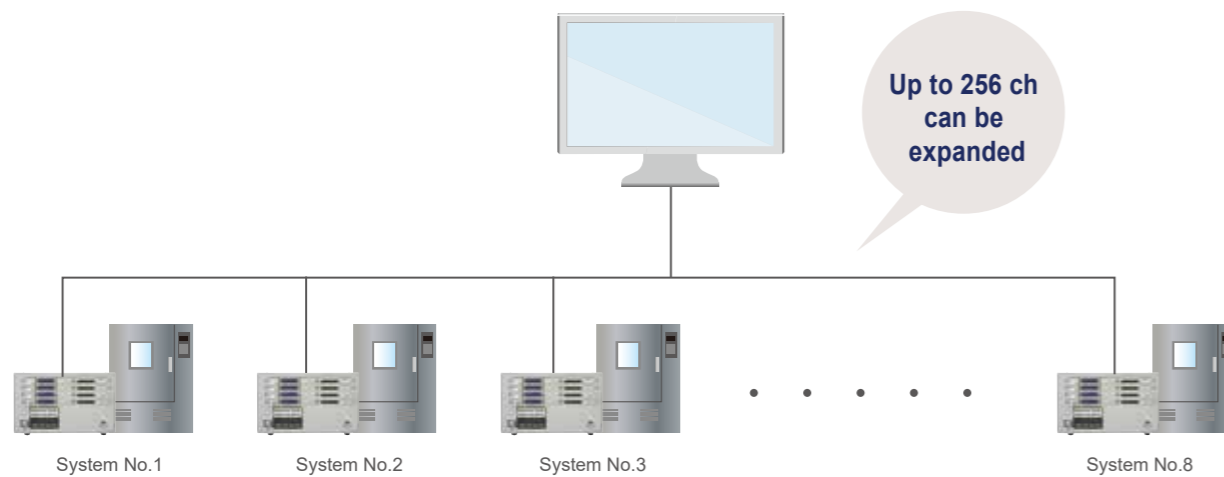
Both low side and high side can be supported with this one.

Features

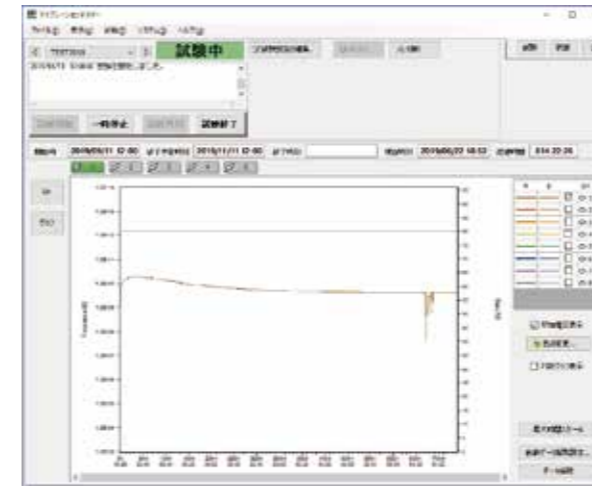
- Individually mounted applied voltage and measurement circuit
- Weak current measurement circuit
- Real-time graph display
- Up to 256ch can be expanded



Connection image



Screen image



Since the graph can be displayed in real time, the progress of deterioration can be easily confirmed during the test.



Data (8ch) for each measurement board can be confirmed at a glance. Data is updated in real time during measurement, and the progress of deterioration can be confirmed as numerical data instantly.

Specifications

	MIG-8600B/32 (Low side model)	MIG-8600B/32 (High side model)
Applied voltage	+1.0 V – +250 V (per 0.1 V)	
Number of channels (per board)	8 ch	
Maximum expansion channel	256 ch	
Insulation resistance measurement range	10 ⁵ Ω–10 ¹⁴ Ω(When 100 V voltage is applied)	
Measurement current measurement range	0.1 pA–500 μA (5 range) * Fixed range / Auto range selectable (0.1 pA–5 nA/10 pA–500 nA / 100 pA–5μA /10 nA–50 μA / 100 nA – 500 μA)	
Measurement range When 100V is applied Current measurement accuracy	5 nA range : ±(5 %fs +100 pA) 500 nA range : ±(2 %fs +5 nA)	5 μA range : ±(1 %fs +10 nA) 50 μA range : ±(0.5 %fs +0.1μA) 500 μA range : ±(0.5 %fs +1 μA)
Bias voltage supply method	Channel-independent bias method (one power source → one channel)	
Bias applied voltage setting	+1.0 V – +250 V (per 0.1 V)	
Bias voltage supply amplifier	Operational amplifier type Output noise: max. ±5 mV Adopting series type high voltage stabilized power supply as high voltage amplifier stabilized power supply High-speed response on the order of 100 μsec with high-voltage operational amplifier	
Bias applied voltage accuracy	±(0.3 % +0.5 V) full scale	
Bias voltage measurement accuracy	±(0.3 % +0.5 V) full scale	
Maximum testable time	9,999 time	
Measurement circuit	Insulation resistance method: Low side current measurement	Insulation resistance method: high side current measurement
Current measurement cable	Dual structure active guard cable	
Cable open detection function	Alarm warning / measurement stop by detecting connector cable disconnection	
Content of collected data	Recording time, elapsed time, resistance value, applied voltage, measured current, temperature / humidity (Chamber communication option required)	
Applicable OS	Windows 10 compatible	
Migration measurement mode	End mode: End at the migration occurrence point Trigger mode: Start at migration threshold, end at threshold Time mode: Migration occurrence threshold, termination threshold occurrence account (quantity specification 50 times)	
Power supply	AC100 V 50/60 Hz Approx. 100 VA/ rack (64 ch)	
Storage unit dimensions	W385 × D432 × H227 mm (Except for projections)	
Weight	Approx. 18 kg (32 ch)	

MIG-87B

Small / light type

The performance of the MIG-8600B is the same and fixed at 16ch, so it is compact and can be installed anywhere. It is possible to apply up to 250V though it is small.

Features

- The performance of the MIG-8600B is the same but smaller
- It is small / light weight and does not choose setting place
- Easy to introduce price range



It can be used by placing on a chamber

MIG-8600PA

Low voltage / constant current type

Even in low voltage tests, current limit can be used to benefit post-test analysis

Features

- The performance of MIG-8600B is the same
- Migration detection with micro current
- For semiconductor products



Specifications

MIG-87B	
Applied voltage	+1.0V ~ +250 V (per 0.1 V)
Number of channels (per board)	8 ch
Maximum expansion channel	16 ch
Insulation resistance measurement range	10 ⁵ Ω-10 ¹⁴ Ω (When 100 V voltage is applied)
Measurement current measurement range	0.1 pA-500 μA (5 range) *Fixed range / Auto range selectable (0.1 pA-5 nA/10 pA-500 nA/100 pA-5 μA/10 nA-50 μA/100 nA-500 μA)
Measurement range When 100V is applied Current measurement accuracy	5 nA range : ±(5 %fs +100 pA) 5 μA range : ±(1 %fs +10 nA) 500 nA range : ±(2 %fs +5 nA) 50 μA range : ±(0.5 %fs +0.1 μA) 500 μA range : ±(0.5 %fs +1 μA)
Bias voltage supply method	Channel-independent bias method (one power source → one channel)
Bias applied voltage setting	+1.0 V~+250 V (per 0.1 V)
Bias voltage supply amplifier	Operational amplifier type Output noise: max. ±5 mV Adopting series type high voltage stabilized power supply as high voltage amplifier stabilized power supply High-speed response on the order of 100 μsec with high-voltage operational amplifier
Bias applied voltage accuracy	±(0.3 %+0.5 V) full scale
Bias voltage measurement accuracy	±(0.3 %+0.5 V) full scale
Maximum testable time	9,999 time
Measurement circuit	Insulation resistance method : Low side / High side current measurement
Current measurement cable	Dual structure active guard cable
Cable open detection function	Alarm warning / measurement stop by detecting connector cable disconnection
Content of collected data	Recording time, elapsed time, resistance value, applied voltage, measured current, temperature / humidity (Chamber communication option required)
Applicable OS	Windows 10 compatible
Migration measurement mode	End mode: End at the migration occurrence point Trigger mode: Start at migration threshold, end at threshold Time mode: Migration occurrence threshold, termination threshold occurrence account (quantity specification 50 times)
Power supply	AC100 V 50/60 Hz Approx. 60 VA
Storage unit dimensions	W385 × D432 × H227 mm (Except for projections)
Weight	Approx.14 kg

Specifications

MIG-8600PA	
Applied voltage	+1.0 V ~ +10 V (per 0.1 V)
Number of channels (per board)	8 ch
Maximum expansion channel	256 ch
Insulation resistance measurement range	10 ⁵ Ω-10 ¹⁴ Ω (When 100 V voltage is applied)
Measurement current measurement range	0.01 pA-50 μA (5 range) * Fixed range / Auto range selectable (0.01 pA-500 pA/0.1 pA-5 nA/100 pA-500 nA/1 nA-5μA /10nA-50μA)
Measurement range When 100V is applied Current measurement accuracy	500 pA range : ±(8 %fs +50 pA) 500 nA range : ±(2 %fs +5 nA) 5nA range : ±(5%fs +100 pA) 5 μA range : ±(1 %fs +10 nA) 50 μA range : ±(0.5 %fs +0.1 μA)
Bias voltage supply method	Channel-independent bias method (one power source → one channel)
Bias applied voltage setting	+1.0 V~+100 V (per 0.1 V)
Bias voltage supply amplifier	Operational amplifier type Output noise: max. ±5 mV Adopting series type high voltage stabilized power supply as high voltage amplifier stabilized power supply High-speed response on the order of 100 μsec with high-voltage operational amplifier
Bias applied voltage accuracy	±(0.3 %+0.5 V) full scale
Bias voltage measurement accuracy	±(0.3 %+0.5 V) full scale
Maximum testable time	9,999 time
Measurement circuit	Insulation resistance method : Low side
Current measurement cable	Dual structure active guard cable
Cable open detection function	Alarm warning / measurement stop by detecting connector cable disconnection
Content of collected data	Recording time, elapsed time, resistance value, applied voltage, measured current, temperature / humidity (Chamber communication option required)
Applicable OS	Windows 10 compatible
Migration measurement mode	End mode: End at the migration occurrence point Trigger mode: Start at migration threshold, end at threshold Time mode: Migration occurrence threshold, termination threshold occurrence account (quantity specification 50 times)
Power supply	AC100 V 50/60 Hz Approx.100 VA/ rack (64 ch)
Storage unit dimensions	W385 × D432 × H227 mm (Except for projections)
Weight	Approx.18 kg (32 ch)

HiP-1000/2000/3000

High voltage type

Real-time measurement of high voltage and weak current

High voltage application is realized by adopting 1ch / 1 power supply / 1 measurement circuit method and dual structure active guard cable which is the biggest feature of IMV.

Features

■ Accurately test with current limit

While high voltage application is possible, low voltage can be limited.

■ Malfunction prevention

Equipped with an interlock to prevent malfunction for high voltage application. Prevent human error.

■ Up to 256ch can be expanded (1 chassis: 32ch)

Up to 256ch can be added even though it is 1000V.

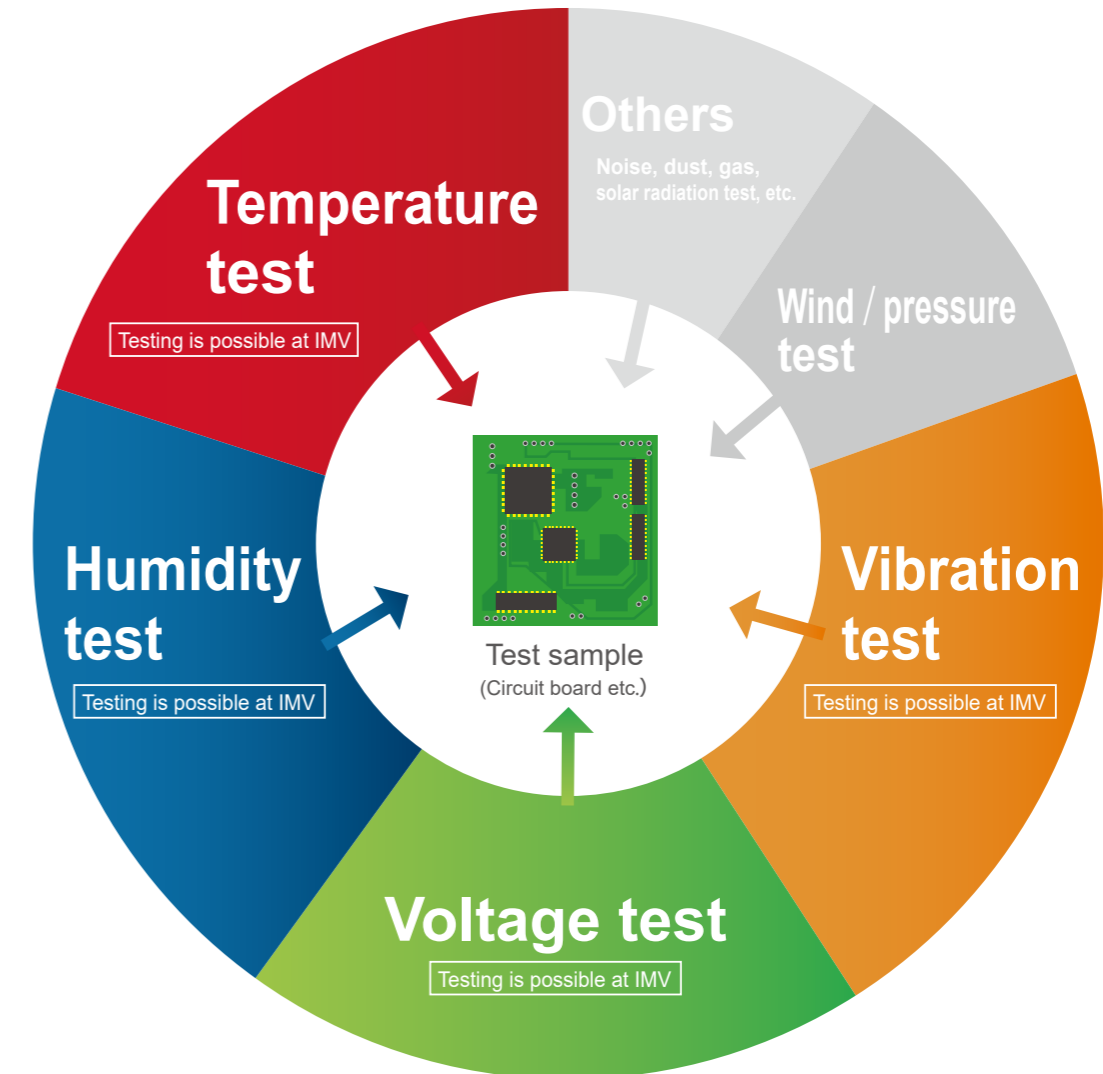


Specifications

	HiP-1000	HiP-2000	HiP-3000
Applied voltage	+1.0 V – +1000 V (per 1 V)	+100 V – +2000 V (per 10V)	+100 V – +3000 V (per 10 V)
Number of channels (per board)	8 ch	4 ch	4 ch
Maximum expansion channel	256 ch	32 ch	32 ch
Insulation resistance measurement range	10 ⁹ Ω–10 ¹⁴ Ω (When 100 V voltage is applied)		
Measurement current measurement range	0.1 pA–500 μA (5 range) * Fixed range / Auto range selectable (0.1 pA–5 nA / 10 pA–500nA / 100 pA–5μA/10 nA–50μA / 100 nA–5000 μA)		
Measurement range When 100V is applied Current measurement accuracy	5 nA range : ±(5 %fs +100 pA) 500 nA range : ±(2 %fs +5 nA) 5 μA range : ±(1 %fs +10 nA) 50 μA range : ±(0.5 %fs +0.1 μA) 500 μA range : ±(0.5 %fs +1 μA)		
Bias voltage supply method	Channel-independent bias method (one power source → one channel)		
Bias applied voltage setting	+1.0 V – +1000 V (per 1 V)	+100 V – +2000 V (per 10 V)	+100 V – +3000 V (per 10V)
Bias voltage supply amplifier	Operational amplifier type Output noise: full scale 0.05 % Adopting series type high voltage stabilized power supply as high voltage amplifier stabilized power supply High-speed response on the order of 100 μsec with high-voltage operational amplifier		
Bias applied voltage accuracy	±(0.3 %+0.5 V) full scale	±(0.4 %+0.5 V) full scale	±(0.5 %+0.5 V) full scale
Bias voltage measurement accuracy	±(0.3 %+0.5 V) full scale	±(0.4 %+0.5 V) full scale	±(0.5 %+0.5 V) full scale
Maximum testable time	9,999 time		
Measurement circuit	Insulation resistance method : Low side		
Current measurement cable	Dual structure active guard cable		
Cable open detection function	Alarm warning / measurement stop by detecting connector cable disconnection		
Content of collected data	Recording time, elapsed time, resistance value, applied voltage, measured current, temperature / humidity (Chamber communication option required)		
Applicable OS	Windows 10 compatible		
Migration measurement mode	End mode: End at the migration occurrence point Trigger mode: Start at migration threshold, end at threshold Time mode: Migration occurrence threshold, termination threshold occurrence account (quantity specification 50 times)		
Power supply	AC100 V 50/60 Hz Approx.100 VA/rack		
Storage unit dimensions	W430×D550×H635 mm (Except for projections)		
Weight	Approx. 35 kg		

What is an environmental testing system?

A system that artificially reproduces various situations in the natural world and tests product reliability. IMV's environmental testing system controls "temperature", "humidity", "voltage" to reproduce natural conditions.



Temperature test

Tests to investigate performance deterioration due to thermal and mechanical stress caused by high temperature and temperature cycle, material change by low temperature, distortion between different materials, etc.

Vibration test

A test that reproduces the vibration environment that a product receives and evaluates its reliability and durability.

Humidity test

Tests to investigate performance deterioration due to insulation failure due to high humidity, decrease in pressure resistance, corrosion or corrosion of metal materials due to moisture absorption, cracking or deformation of plastic due to low humidity, etc.

Voltage test

Insulation evaluation test by voltage application, test to check microcomputer malfunction, runaway, parts breakage etc. due to abnormal voltage and voltage fluctuation.