



High Voltage Switch Matrix

Features

- Isolation voltage 3kV
- Leakage < 30pA @ 3kV typical
- Guarded relay matrix and connectors, optional Kelvin guarding (force/sense)
- Discharge feature
- Up to 12 inputs x 12 outputs, optional expansion units for additional 12 outputs each
- Any combination of input and output connectors, e.g. Keysight HV triaxial, Tektronix HV triaxial, SHV, BNC triaxial (500V), special high voltage 12x connector & cable
- Software-compatible to standard products

Applications

- Semiconductor characterization
- Research & science laboratories

Specifications

The **mb-Technologies** high voltage switch matrix is a high performance switching solution. It provides a fully populated switch matrix connecting a number of inputs and outputs. The matrix uses a novel isolation and guarding technique and provides the best high voltage isolation performance available today!

Configuration

The switch mainframe provides 12 matrix inputs and up to 12 outputs. Expansion units can be added for 12 additional outputs each. All units are then logically combined to one large switch and are controlled by a single interface.

The matrix uses double switch relays for signal and guard. Optionally triple switch relays can be installed to support force/sense (Kelvin guarding). Note this also requires twice the number of input and output connectors.

Connector Options

Various connector options are available for the matrix inputs and outputs. High and low voltage connectors can be mixed to use any combination of measurement equipment. While in any configuration the matrix is capable of handling 3kV, low voltage equipment usually requires external protection units.

Connector	Performance
Keysight (Agilent) HV triaxial	3kV, $10^{15} \Omega$
Tektronix (Keithley) HV triaxial	3kV, $10^{15} \Omega$
VPC HV triaxial (12x)	3kV, $10^{15} \Omega$
SHV/BNC	3kV, $10^{12} \Omega$
BNC triaxial	500V, $10^{15} \Omega$
BNC standard	500V, $10^{12} \Omega$



Mixed connector configuration with Tektronix HV triaxial for input E, inputs F to H are BNC triaxial. For the outputs our cost-effective, twelvefold high voltage connector/cable solution is used.

Front-Panel

A color graphics display and keyboard shows the matrix communication and connection status and is also used for testing purposes and setting communication options.

Communication Interface

USB, RJ45 (LAN), IEEE-488 and RS232 interfaces are installed and support easy-to-use text commands. The command set is compatible to standard switch solutions.

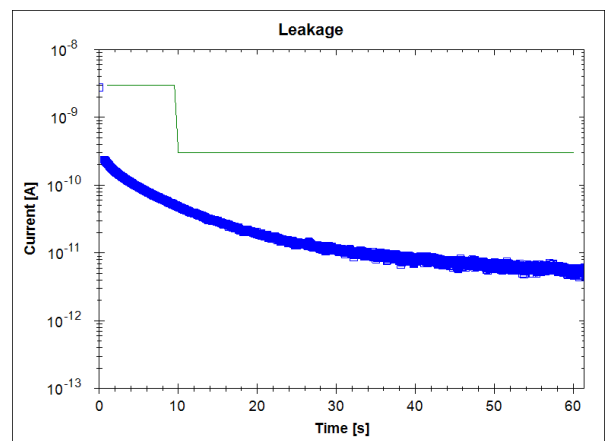
A 16-bit digital I/O connector is provided to control additional equipment.

Specifications

Parameter	Value
Isolation voltage	3kV ⁽¹⁾
Carry current	2A ⁽¹⁾
Leakage current	< 30pA ⁽²⁾
Contact resistance	< 1Ω ⁽³⁾
Discharge resistors	1MΩ
Switching time	5ms ⁽⁴⁾

- (1) Switching w/o voltage or current applied known as cold switching (recommended)
- (2) Typical value after 60s
- (3) Discharge resistors are activated by software, digital I/O line or front panel button. They connect all matrix inputs to ground.
- (4) Without communication overhead

See user's manual for more specification details.



Typical leakage performance