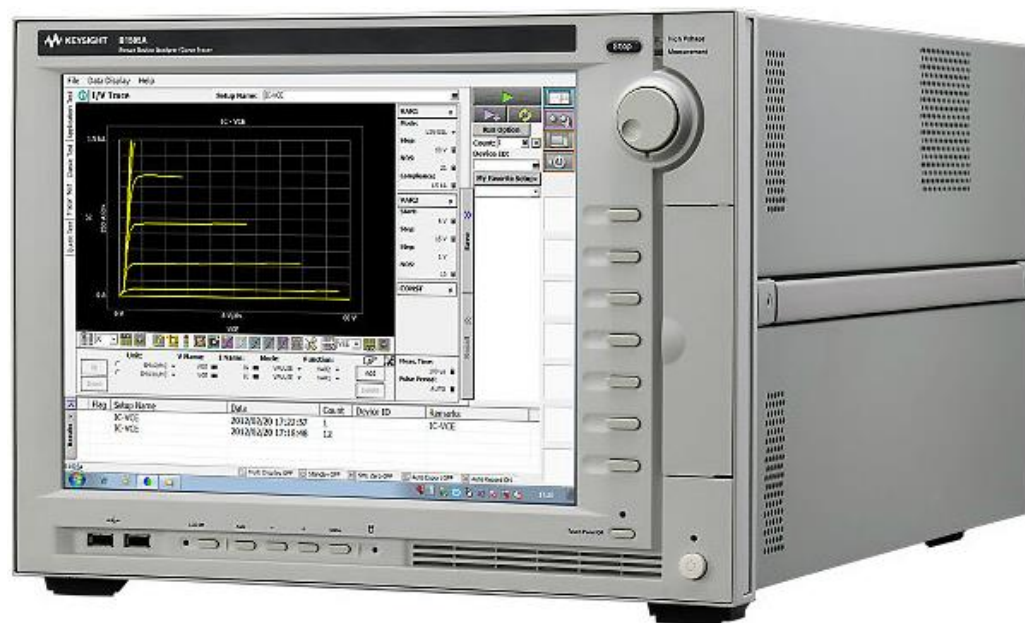
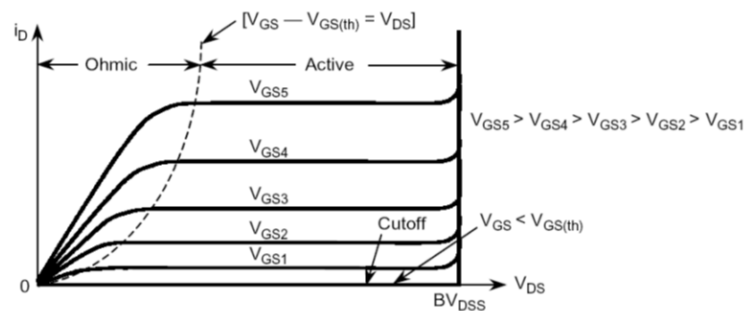


半导体参数测试仪 B1505A

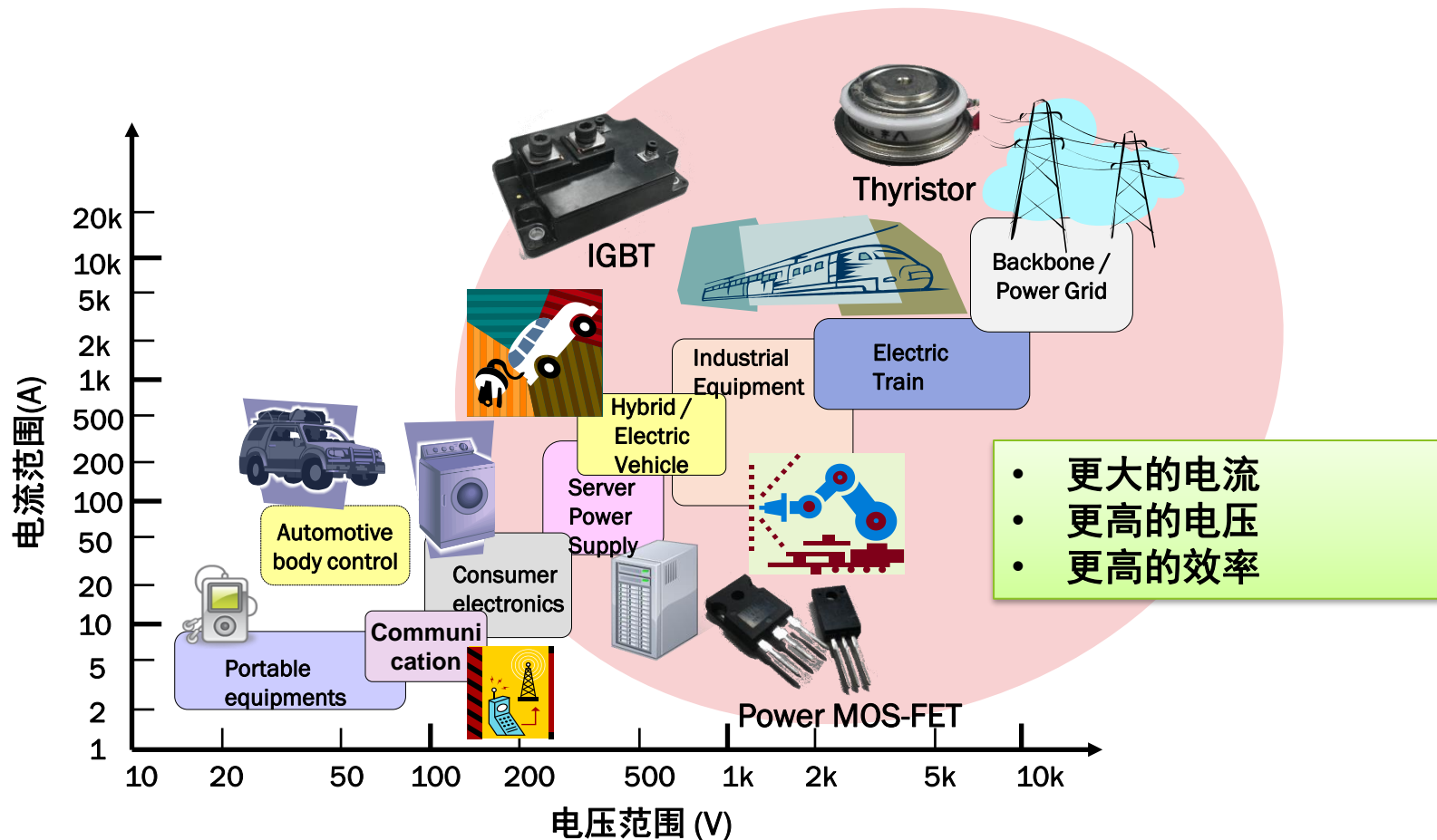


目录

- 半导体及测量设备
- 模块简介
- 硬件连接
- IV测试
- CV测试
- Qg测试



大功率器件



现代大功率器件的测试要求

- ◆ 更高的激励电流(>100 A)
- ◆ 更好的激励电压(up to 10 kV)
- ◆ 精确的导通电阻测试（低至几个毫欧）
- ◆ 电流崩塌效应 GaN
- ◆ 精确的电容测试(影响开关速度)

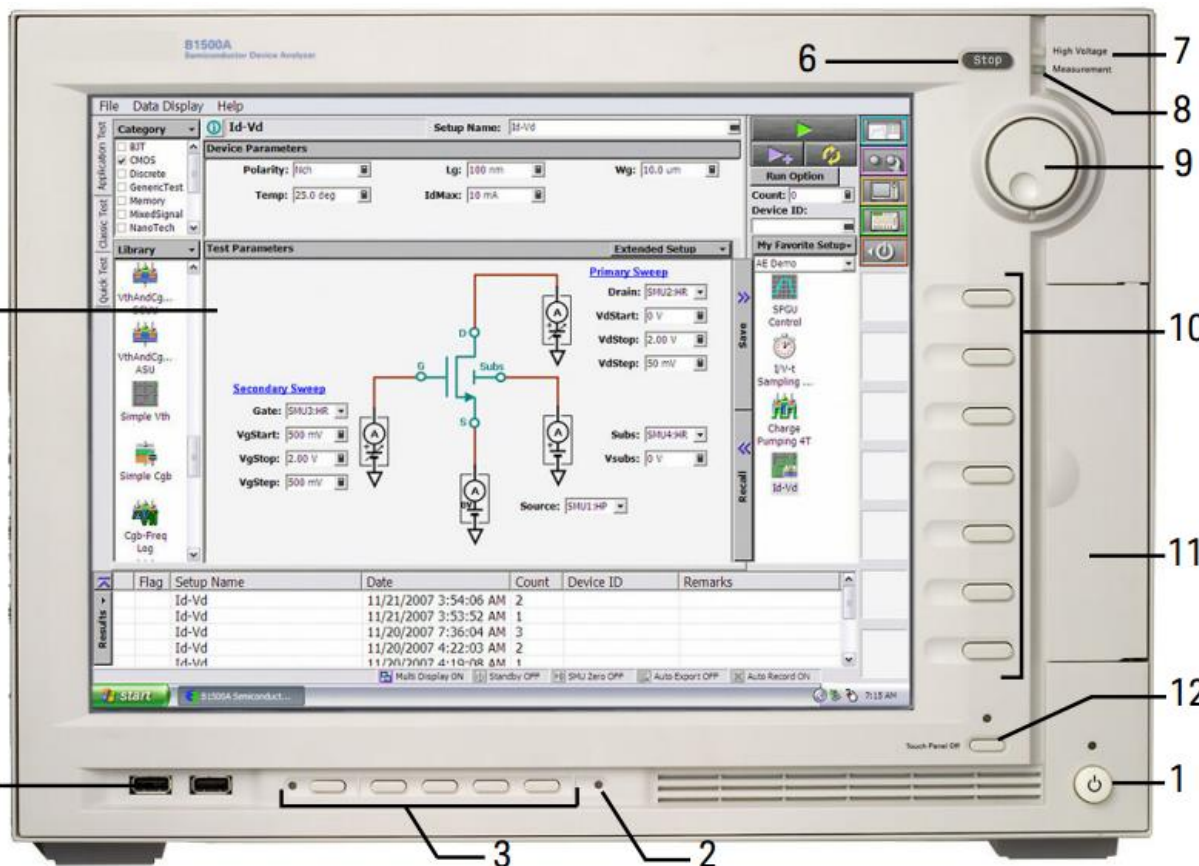
SiC GaN
WBG Device
Wide Band Gap



前面板

5. Easy Expert测试软件

简单直观的操作界面
15英寸的触摸屏



6. Stop 按钮

按下后仪器立即停止输出
保护操作人员

7. 高压指示灯

当输出超过 $\pm 42V$ 时变红
警告操作人员

12. 屏幕触摸功能开关

关闭屏幕触摸功能
防止自动测试时误操作

背面板



4. GPIB
用于编程控制仪器

13. 数据通信I/O端口
连接夹具进行通信

14. Interlock
连接夹具
使其合上才能输出大于±42V

B1505A (可达1500 A / 10 kV)

Ultra High Current Unit

(N1265A UHC Expander/Fixture and two units of B1514A MCSMU/B1512A HCSMU)
Up to 1500 A / 500 A



Ultra High Voltage Unit

(N1268A UHV Expander and two B1514A MCSMU or a combination of a B1512A HCSMU and a B1514A MCSMU)
Up to 10 kV

High Voltage Medium Current Unit

(N1266A UHV Expander and two units of B1514A MCSMU/B1512A HCSMU)
 **± 1500 V / 2.5 A ,
 ± 2200 V / 1.1 A**

Multi Freq CMU

(B1520A MFCMU)
3000V biased CV

Medium Power SMU

(B1511A MPSMU)
**Up to 100 V, 100 mA
10 fA resolution**

High Power SMU

(B1510A HPSMU)
**Up to 200 V, 1A
10 fA resolution**



High Voltage SMU

(B1513B HVSMU)
Up to 3000 V/8mA

High Current SMU

(B1512A HCSMU)
Up to 20 A/20V pulse

Medium Current SMU

(B1514A MCSMU)
Up to 1 A / 30 V pulse

B1505A 具备功能

Temperature Solution

N1271A-001

Thermal Test Stage and Hood for N1259A/N1265A.

inTest Thermal Plate to support on existing N1259A/N1265A fixture.

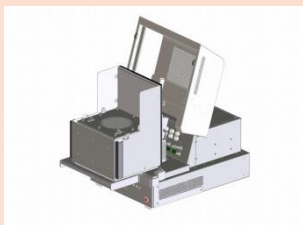
InTest HP289 Thermal plate (not bundled)



N1271A-002

ThermoStream Compatible Enclosure for N1265A.(3kV IV)

-50°C ~250°C, Thermo Couple x 2 , Banana Terminal

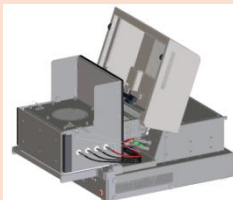


inTEST ThermoStream (not bundled)

N1271A-005

ThermoStream Compatible Enclosure for N1265A.(3kV IV, CV&10kV)

-50°C ~250°C, Thermo Couple x 2 , Banana Terminal , SHV Terminal, UHV Terminal.



Capacitance Solution

N1272A

Device Capacitance Selector

Fully automatically Capacitance measurement to switch peripheral circuits composed Bias Tee



N1273A

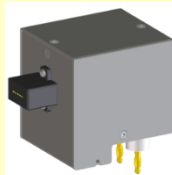
Capacitance Test Fixture

This fixture is used with N1272A



N1273AU-010

TO Socket Adapter



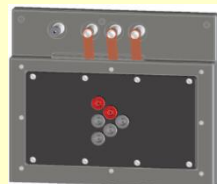
N1273AU-011

N1273AU-011 Universal Socket Adapter



N1273AU-013

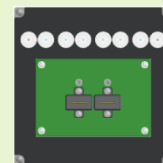
Curve Tracer Adapter



Gate Charge Solution

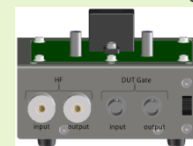
N1259A-014 / N1265A-014

Gate Charge Socket Adapter for Packaged Device.



N1275A

On-wafer Gate Charge Adapter 3kV/500A



N1274A

On-wafer Gate Charge Adapter/Selector for 3kV/20A



Fully automatically Gate Charge/IV measurement .

Multi HVSMU Solution

B1513C HVSMU

Up to five HVSMU configuration is supported

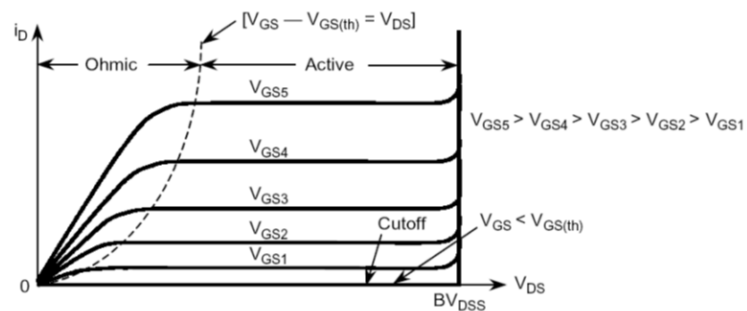


Accessories

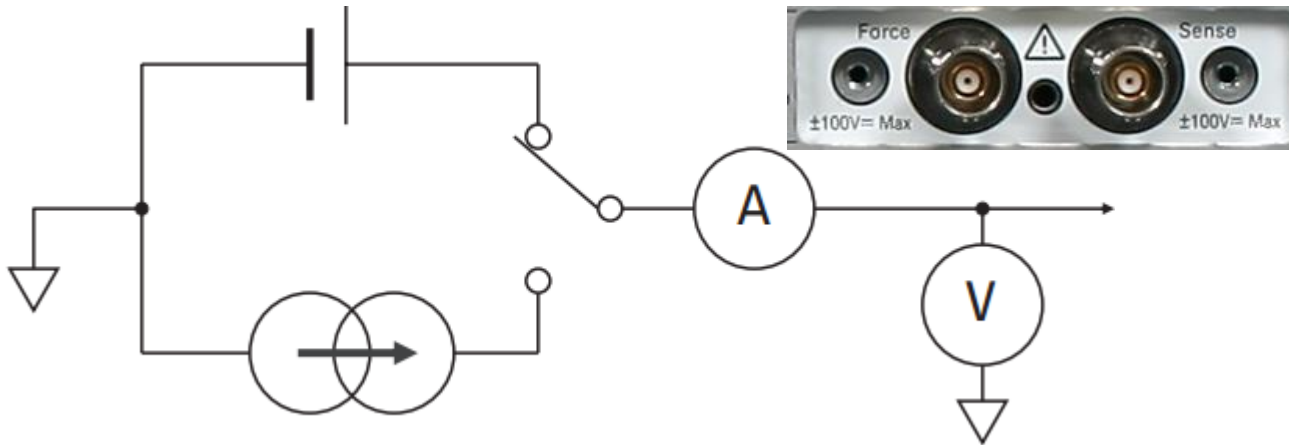
Model	Description
N1254A-525	SHV Cable Assy 1.5m - SHV Plug To Open-end
N1254A-526	Ultra High Current Cable, 2m
N1254A-527	PTFE Standoff, Jack, 4 ea.
N1254A-528	PTFE Standoff With Banana Plug, 4 ea.
N1254A-557	Test Leads And Connection Kit For Thermal Test with N1271A
N1254A-558	SHV Cable 3m

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SMU(Source Monitor Unit)



Voltage Source

Current Source

Voltage Meter

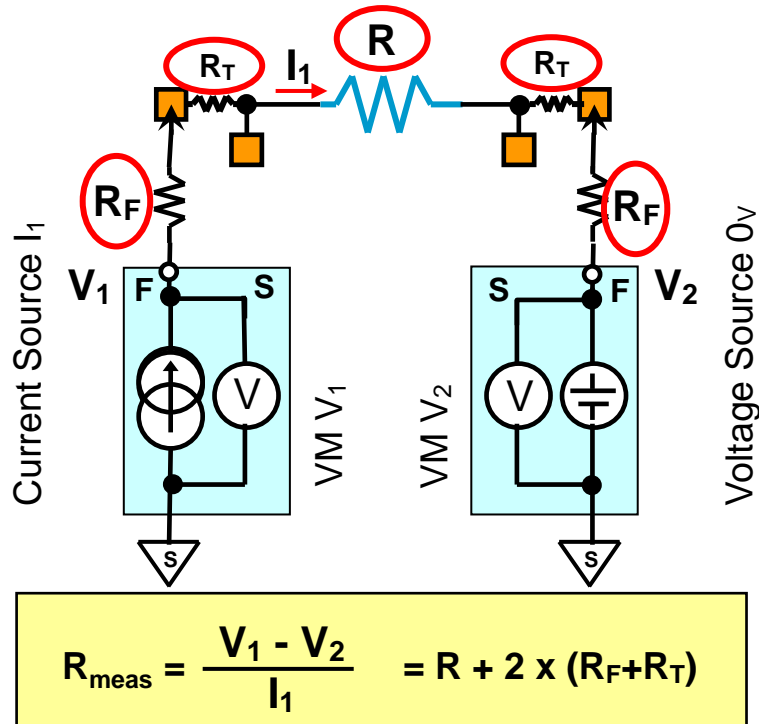
Current Meter

Module	HPSMU	MPSMU	HRSMU
Maximum Force Voltage	±200 V	±100 V	±100 V
Maximum Force Current	±1 A	±100 mA	±100 mA
Voltage Measurement Resolution	2 μ V	0.5 μ V	0.5 μ V
Current Measurement Resolution	10 fA	10 fA	1 fA

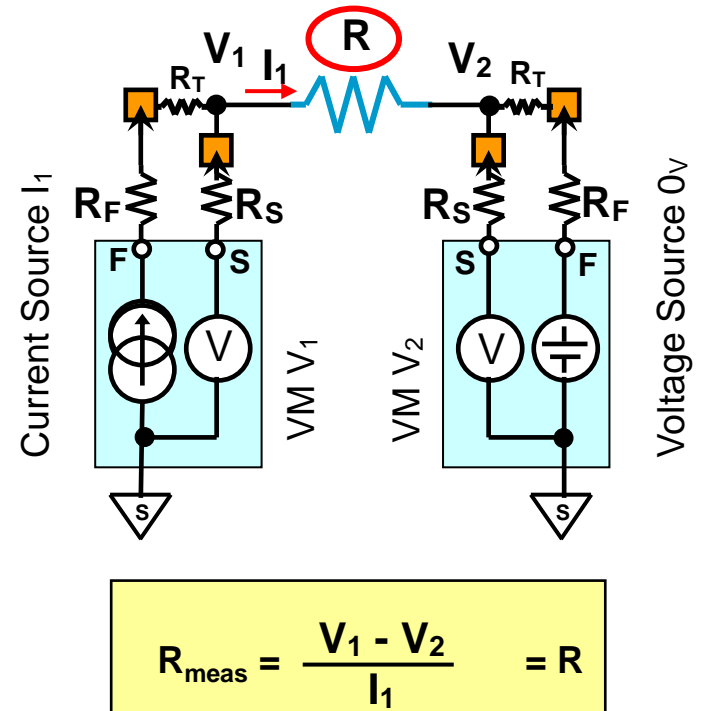
Kelvin连接

- 测试线缆包含寄生电阻，如果不采取措施，会影响测试结果。
- Kelvin连接是采用一个电压表来检测输出的电压，由于电压内阻很大，因此不会影响阻抗测试结果。
- **Kelvin连接是精确测试非常重要的技术，尤其是进行低阻抗测试时。**

非Kelvin连接



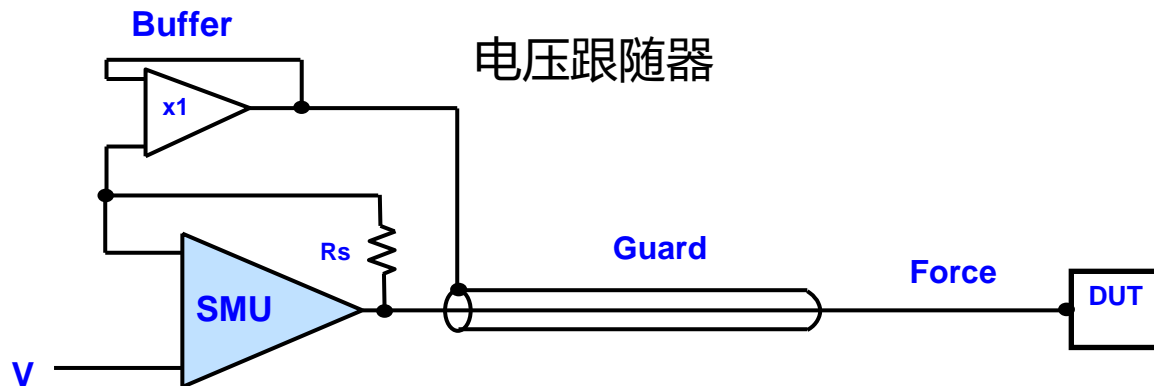
Kelvin连接



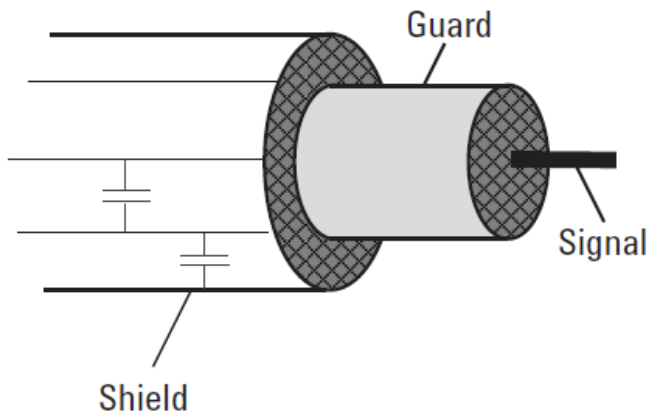
三轴与两轴——1

Guarding 与三轴电缆 (Triax)

SMU 输出端示意图



三轴电缆示意图



三轴与两轴——2

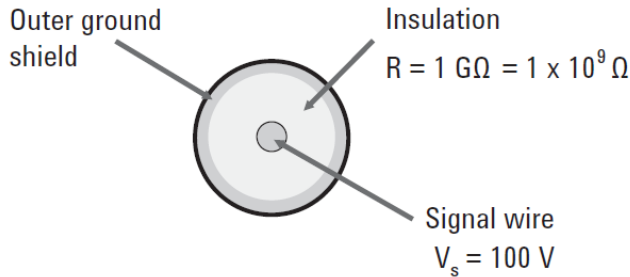
Guarding 与三轴电缆 (Triax)



三轴电缆的三轴分别为Signal、Guard和Shield

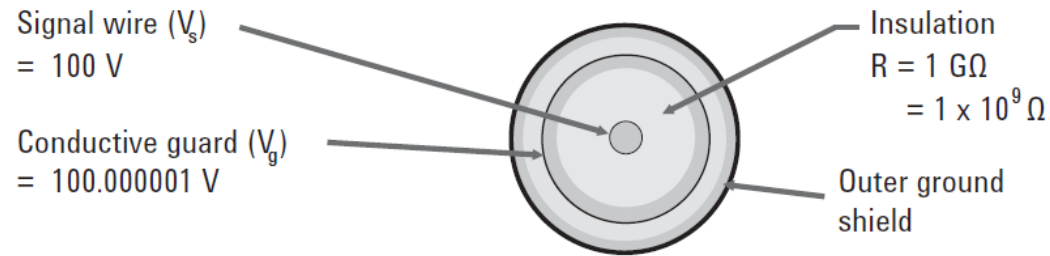
三轴电缆采用Guard技术，能够有效地降低泄露电流产生的误差。

双轴线缆的泄露电流



$$i_{leak} = \frac{100 \text{ V}}{1 \times 10^9 \Omega} = 1 \times 10^{-7} \text{ A} = 100 \text{ nA}$$

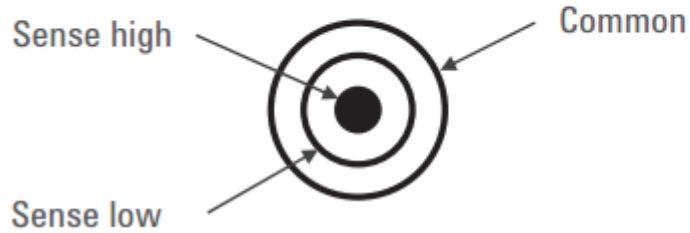
三轴线缆的泄露电流



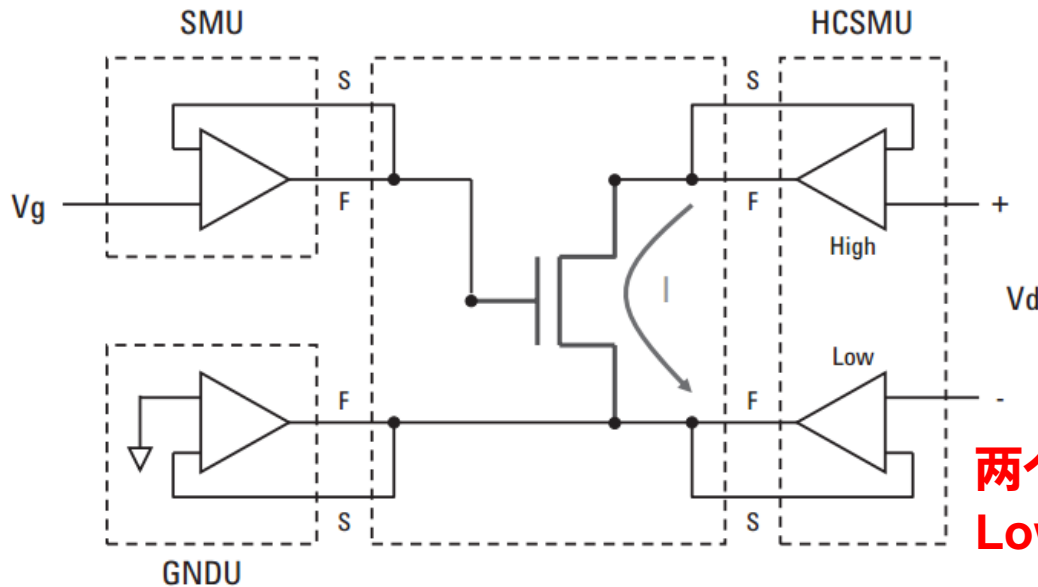
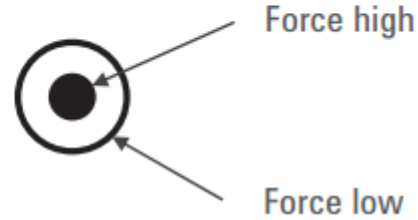
$$i_{leak} = \frac{(100.000001 \text{ V} - 100 \text{ V})}{1 \times 10^9 \Omega} = \frac{1 \times 10^{-6} \text{ V}}{1 \times 10^9 \Omega} = 1 \times 10^{-15} \text{ A} = 1 \text{ fA}$$

Medium / High Current Unit – MCSMU/HCSMU

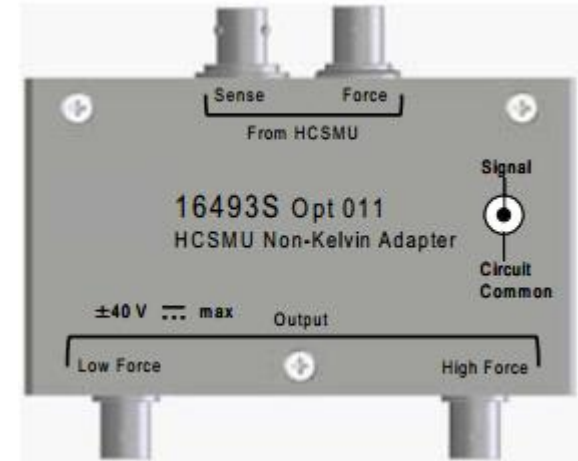
Sense output
(triaxial)



Force output
(coaxial)



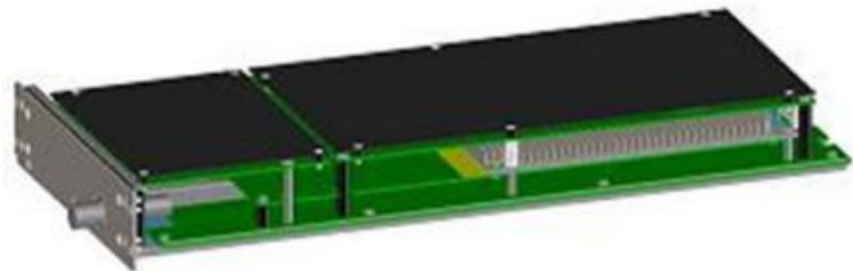
**电流模块使用时必须用适配器
将Force/Sense转为High/Low**



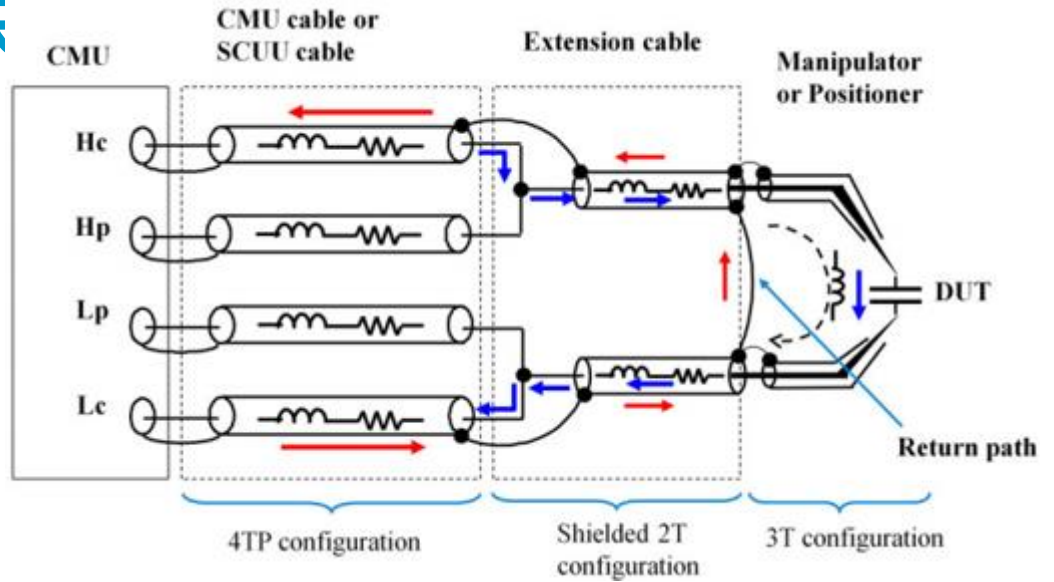
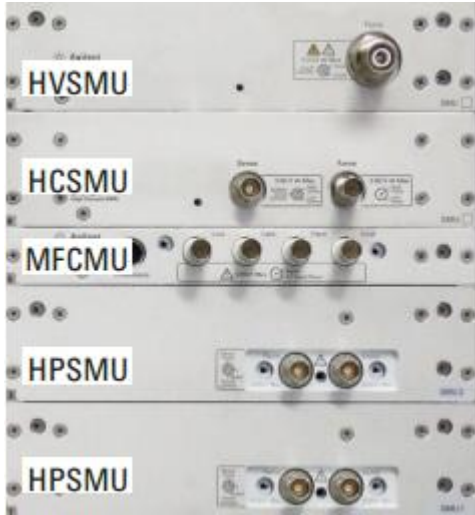
**两个端口必须连接
Low端口需要提供参考地**

High Voltage SMU

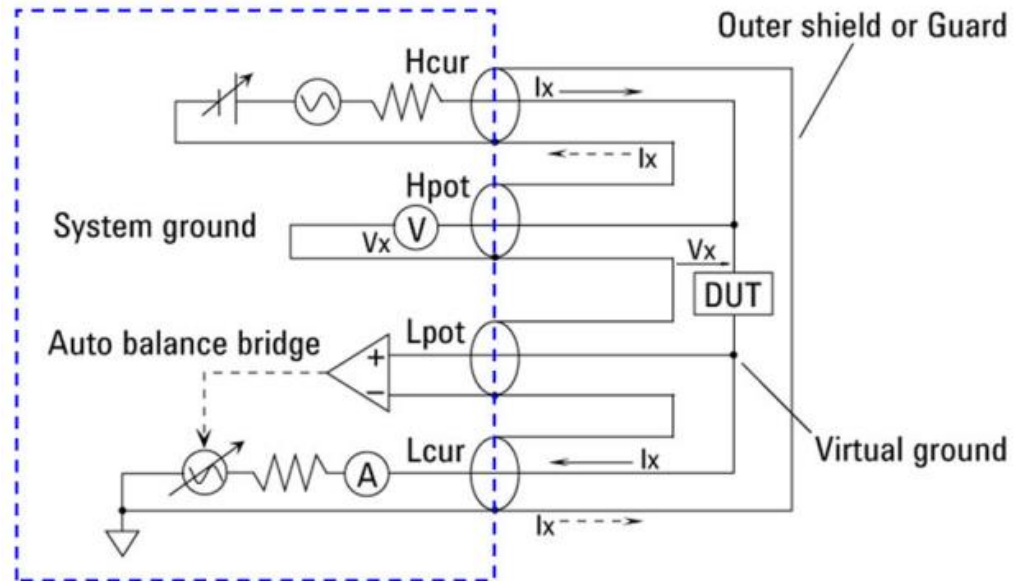
- Occupies 2 slots of B1505A
- 3000 V/4 mA or -3000 V/-4 mA output
- 1500 V/8 mA or -1500 V/-8 mA output
- 1/1,000,000 set/measurement resolution
- DC sweep, Pulsed sweep
- Faster measurement time



MFCMU – CV测试模块

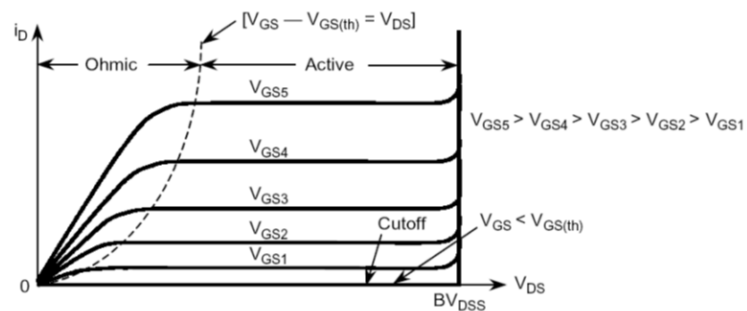


CMU

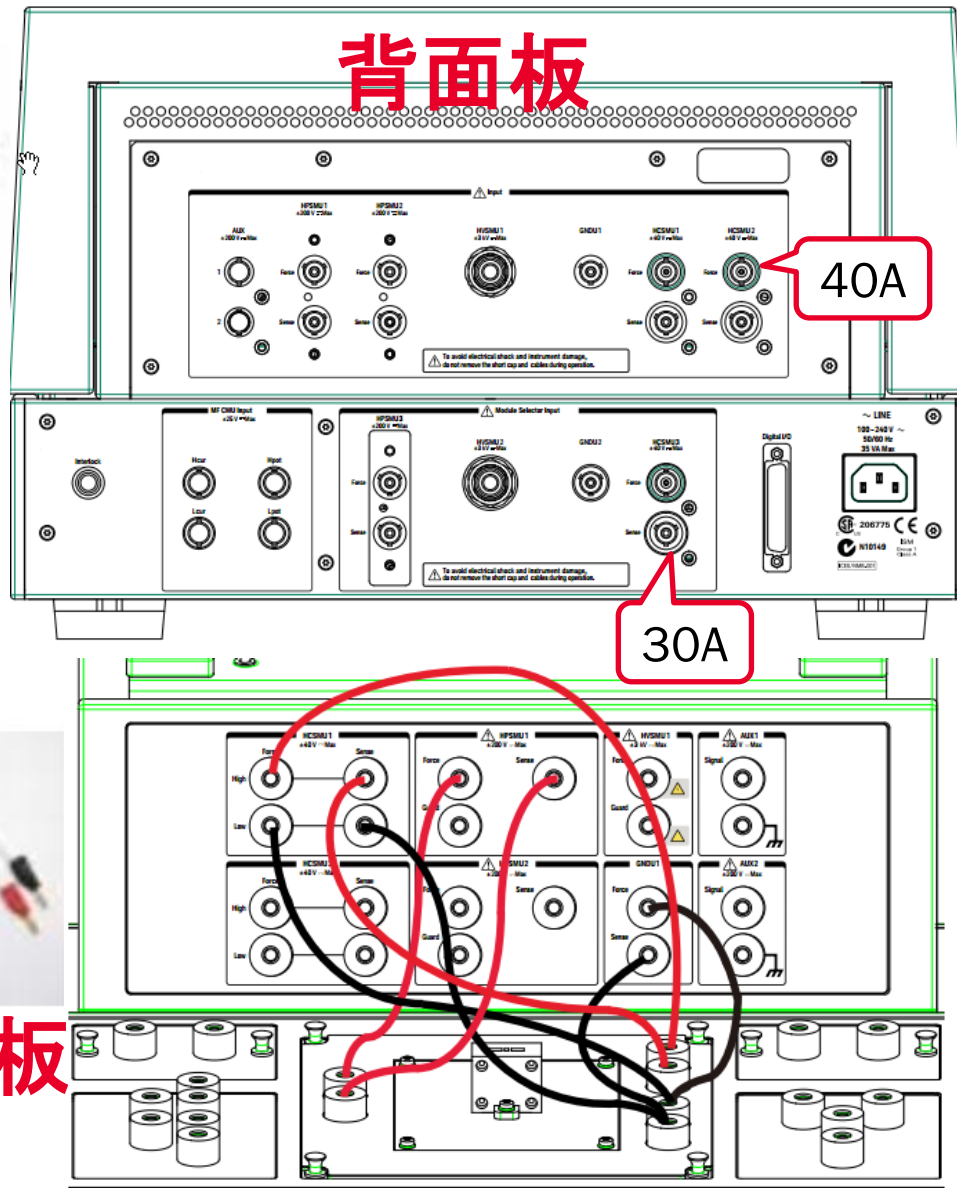


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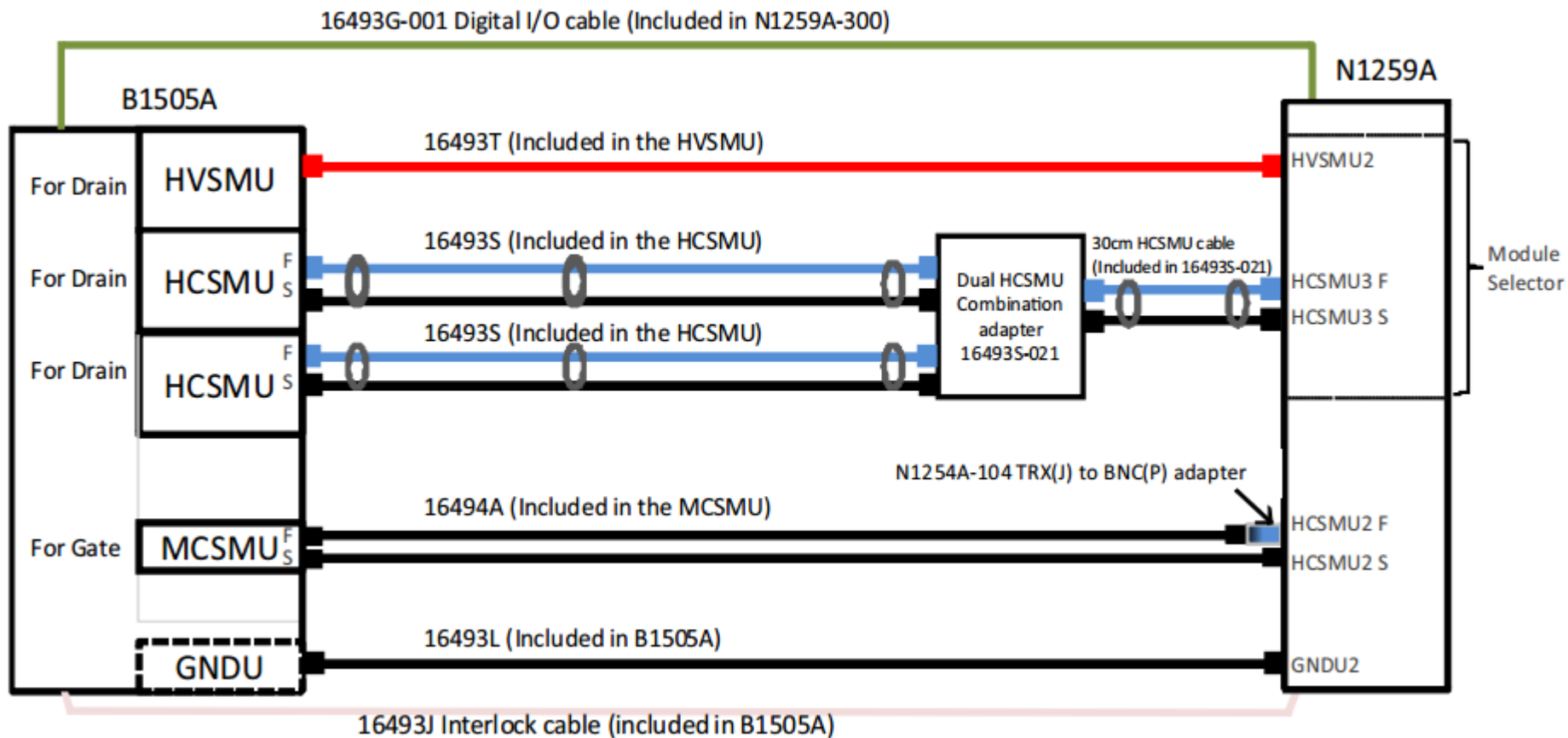
- 半导体及测量设备
- 模块简介
- 硬件连接
- IV测试
- CV测试



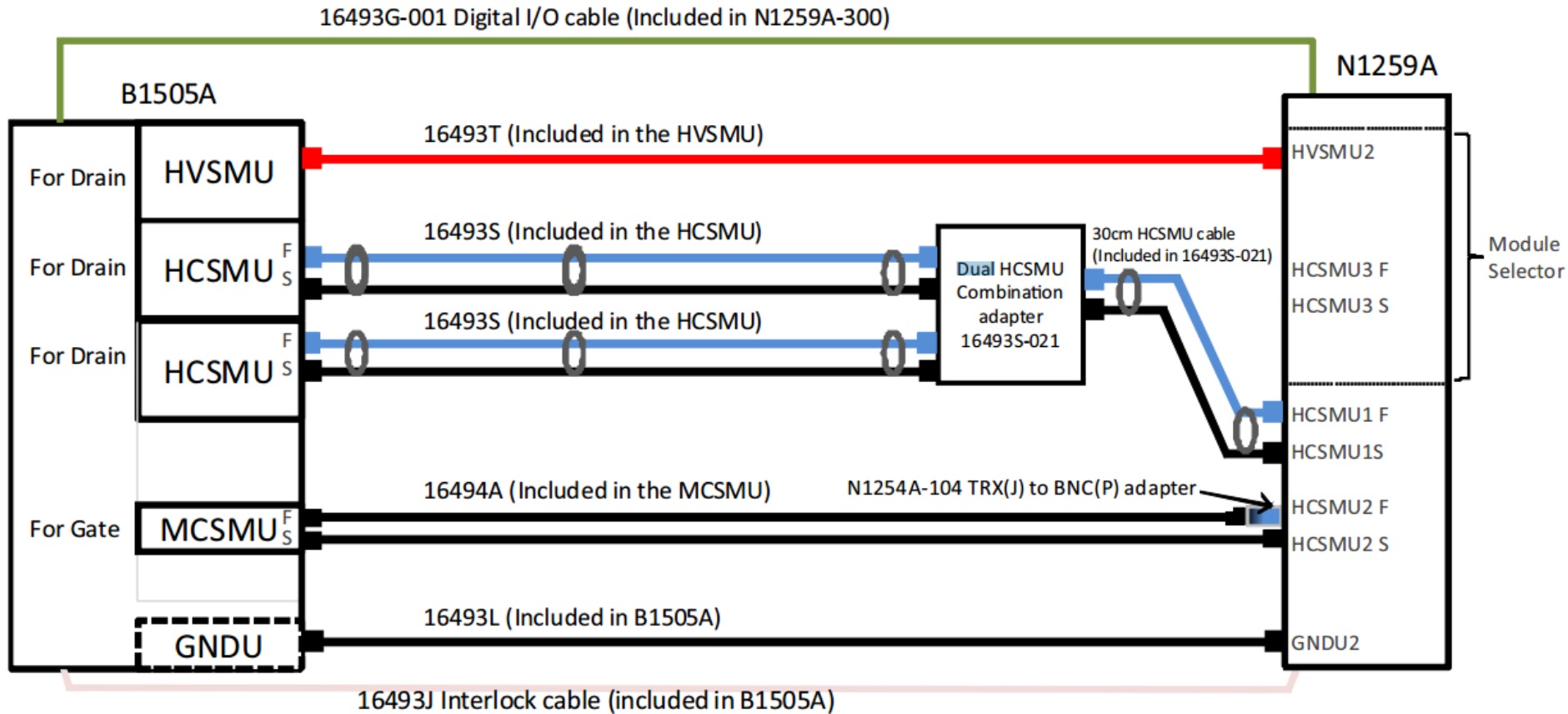
N1259A 夹具



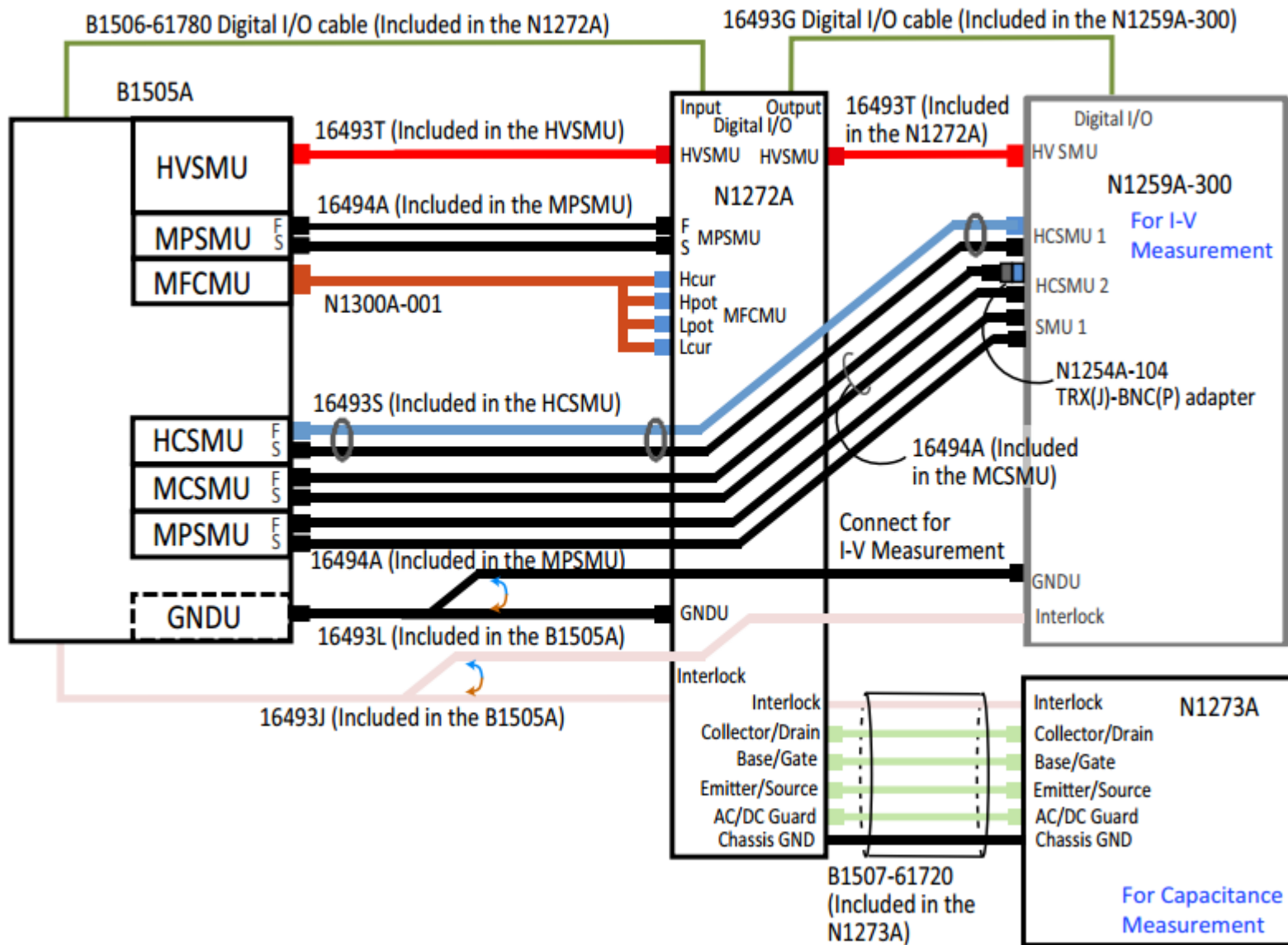
3000V/30A IV测试连接



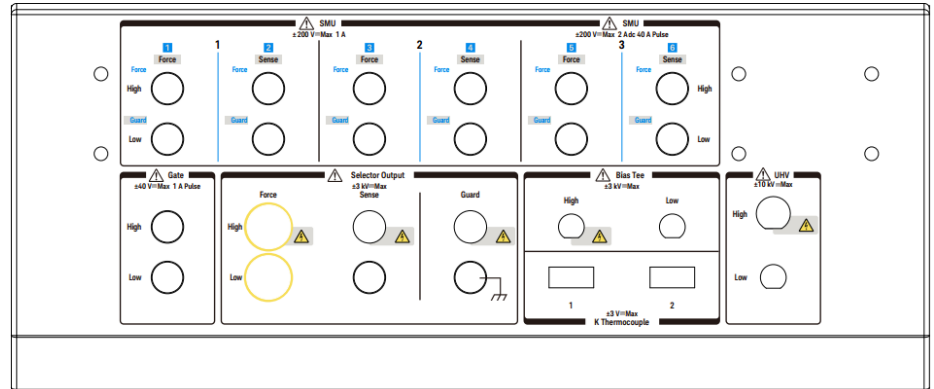
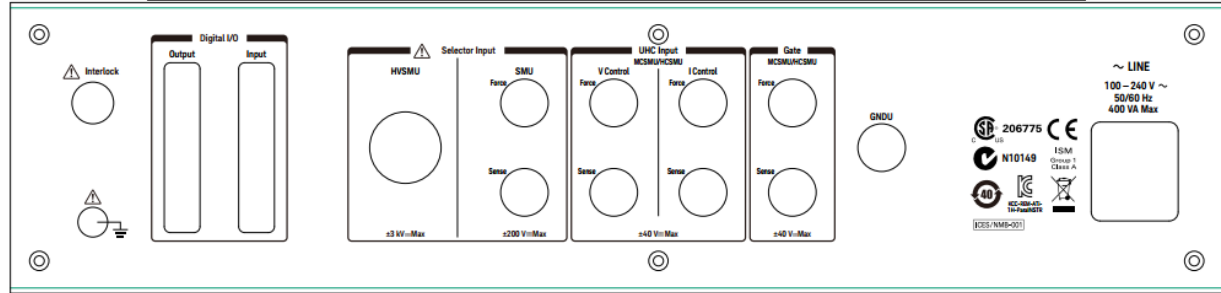
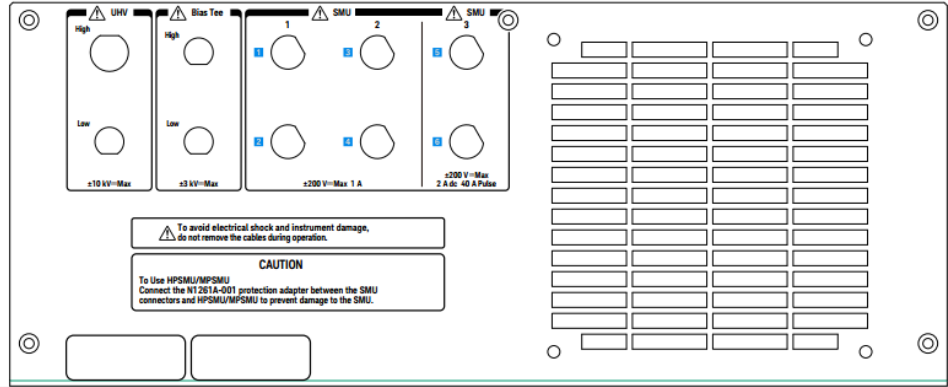
3000V/40A IV测试连接



3000V CV测试连接

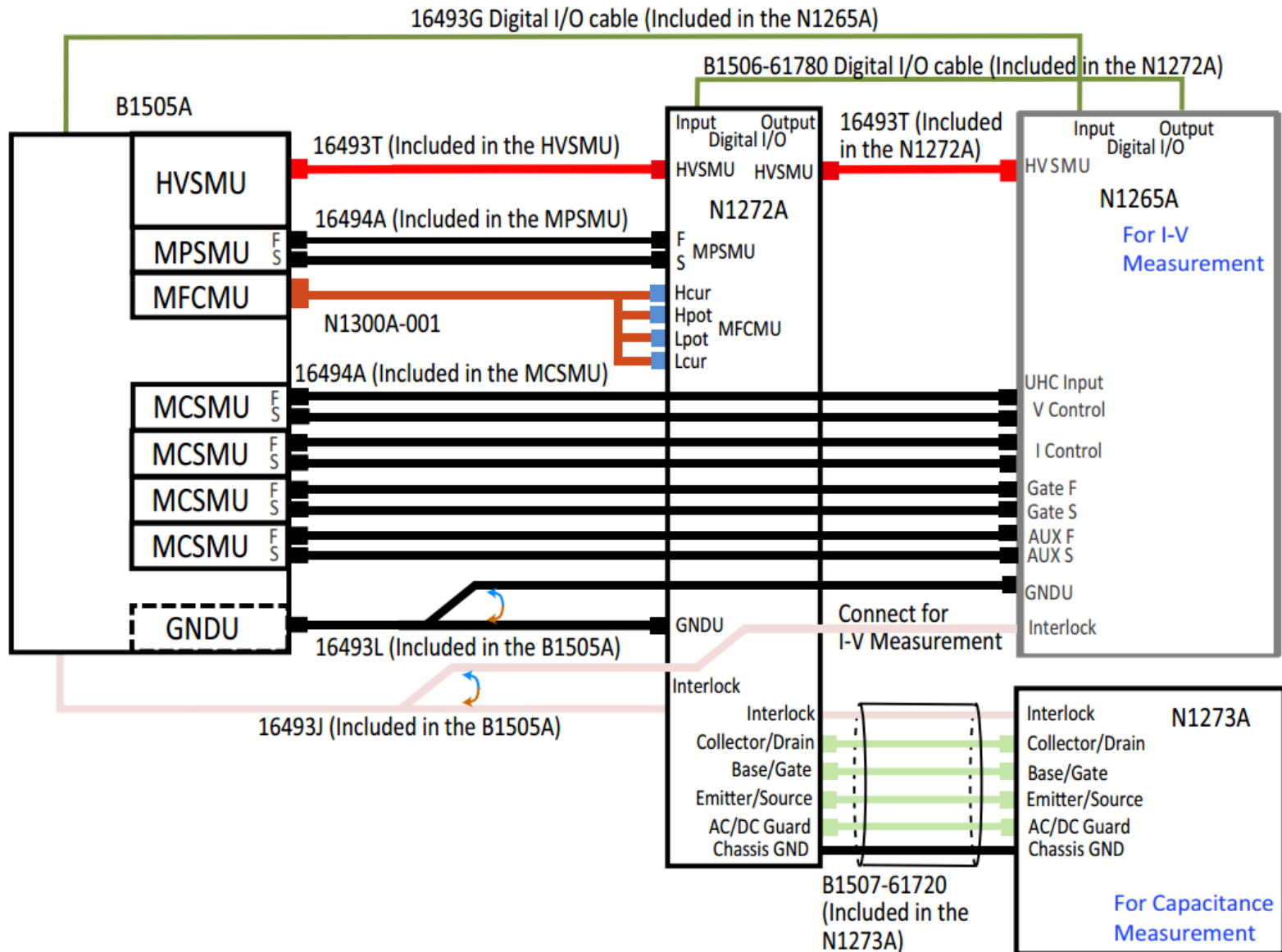


UHCU (超高电流模块)



是德科技 (中国) 有限公司
以是为本 以德致远 专注测量75载

3000V/1500A IVCV测试连接



1500A/10kV IV CV Qg连接图

