Specifications

Reference Data for HP 41423A

Maximum capacitive load:	1000pF
Maximum guard capacitance:	300pF
Maximum shield capacitance:	800pF
Typical output resistance:	0.2Ω
Guard offset voltage:	± 1mV
Noise (typical)	
Voltage source:	0.01% of V range (rms)
Current source:	0.1% of I range (rms)
Voltage monitor:	0.02% of V range (p-p)
Current monitor:	1% of I range (p-p)
Change polarity time:	100msec
Channel off/on time:	100msec
Maximum slew rate:	12V/msec

HP 41424A Voltage Source/Voltage Monitor Unit

The HP 41424A VS/VMU provides two voltage monitors and two voltage supplies with built-in ammeters. The voltage monitors can be connected in a differential measurement configuration for improved resolution. This module occupies a single slot.

Voltage Source Output/Measurement Range, Resolution and Accuracy.

Voltage Range	Set Resolution	Accuracy	Maximum Current
± 20V	1mV	± (0.1% + 10mV)	100mA
± 40V	2mV	± (0.1% + 20mV)	20mA

Current Range	Meas. Resolution	Accuracy
± 20mA	20μA	± (3% + 200μA)
± 100mA	100μA	± (3% + 1mA)

Voltage Monitor Range, Resolution and Accuracy

Voltage Range	Meas. Resolution	Accuracy
± 2V	40μV	± (0.05% + 1mV)
± 20V	400μV	± (0.05% + 10mV)
± 40V	800μV	± (0.05% + 20mV)

Differential Voltage Monitor Range, Resolution and Accuracy

Voltage Range	Meas. Resolution	Accuracy	Max. Common Voltage
± 0.2V	4μV	± (0.2% + 0.4mV + 2.5μV × V_{IN})	± 40V
± 2V	40μV	± (0.2% + 2mV + 25μV × V_{IN})	

Note: V_{IN} is the VM input voltage (common mode) in volts.

Voltage/Current Compliance

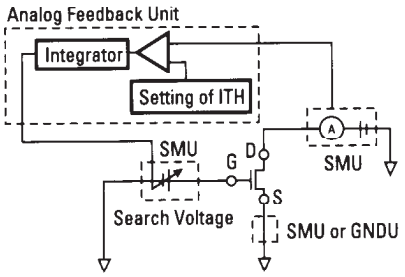
The VS has a current limiter. The limiter value is automatically determined by the output voltage range. If the output range is 20V, the current limit is 100mA. If the output range is 40V, the current limit is 20mA.

Reference Data for HP 41424A

VS typical output resistance:	0.2Ω
VS maximum capacitive load:	10μF
VS maximum slew rate:	0.2V/μsec
VS current limit accuracy:	−0%, + 10%
VS typical output noise:	0.005% of V range (rms)
VM typical input resistance:	≥100MΩ
VM maximum leakage current (@0V):	2nA
VM typical noise level at input:	0.01% of V range (p-p)
DVM typical differential measurement noise:	0.02% of V range (p-p)

HP 41425A Analog Feedback Unit

The HP 41425A AFU searches for a target current or voltage on one SMU by controlling (sweeping) the output voltage of another SMU. It requires one slot and two SMUs. Only one AFU can be used per HP 4142B mainframe. SMUs may be either the HP 41420A HPSMU or HP 41421B MPSMU. The analog search capability of the AFU reduces the time required for measurements like h_{FE} or V_{th} which would otherwise require a more lengthy binary search technique.



Reference Data for HP 41425A

Monitor Specifications

Range and resolution:	Same as SMU's.
Setting accuracy:	SMU's accuracy + 0.1% of value + 0.1% of range.
Monitor accuracy:	Same as SMU's.
Overrange:	0%
Maximum target voltage:	180V (HP 41420A HPSMU) 90V (HP 41421B MPSMU)
Maximum current:	900mA (HP 41420A HPSMU) 90mA (HP 41421B MPSMU)

Search Specifications

Voltage ranges:	2V, 20V, 40V, 100V, or 200V (HP 41420A only)
Slew rates:	0.5mV/ms to 1000V/ms in decade steps
Slew rate resolution:	1/100 of slew rate range
Slew rate accuracy:	35% of setting + 5% of range
Start voltage accuracy:	0.5% of setting + 0.5% of voltage range
Stop voltage accuracy:	3% of voltage range
Ramp stop delay time:	5μsec (typically)

HP 16087A Module Selector

The HP 16087A module selector is a 3-input scanner which allows remote control of the connection of an SMU, HCU, or HVU to a single DUT pin. Only one module selector per HP 4142B mainframe is allowed. It may be used by itself or as a built-in option of the 16088B test fixture.

Input Channels

Channel Type	Number of Channels	Connection
SMU (HP 41420A/41421B)	1	Kelvin
HCU (HP 41422A)	1	Kelvin
HVU (HP 41423A)	1	Non-Kelvin

Allowable Voltage and Current

Channel	Max Voltage	Max Current
SMU	200V	1A
HCU	10V	10A
HVU	1000V	10mA