COMPUTER AIDED TEST
High Performance Switching and Control
HP Model 3235A

Maximum Voltage: Any center or shield to any other center, shield, guard or chassis: 42V DC+AC Peak. Guard to Chassis: 42V DC+AC Peak.

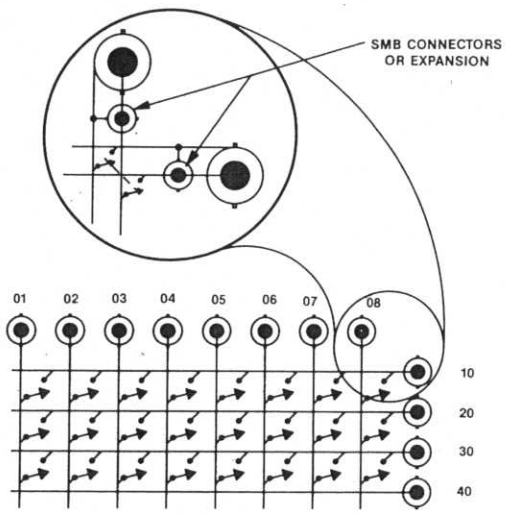
AC Performance for $Z_L = Z_S = 50\ \Omega$

	≤3MHz	≤10MHz	≤3MHz	≤100MHz
Insertion Loss (dB)	<0.4	<0.5	<0.7	<1.0
Crosstalk (dB)	<–115	<–105	<–95	<–85
VSWR		<1.14	<1.35	<1.50

Switched-Shield Coaxial Matrix (HP34506)

This 4x8 full crossbar matrix offers highly flexible switching for 50Ω systems. You can use the matrix to simultaneously connect any of four channels to any of eight channels. Similar to the coaxial multiplexer module, the coaxial matrix switches both center conductors and shields. Intended for 50Ω systems.

Switched-Shield Coaxial Matrix



Maximum Voltage: Any center or shield to any other center, shield, guard or chassis: 42V DC+AC Peak. Guard to Chassis: 42V DC+AC Peak.

Maximum Current per row or column: 1A DC or AC RMS

Maximum Power per crosspoint: 24W or 24VA (resistive)

AC Performance for $Z_L = Z_S = 50\Omega$

	≤1MHz	≤3MHz	≤10MHz	≤30MHz
Insertion Loss (dB)	<0.4	<0.5	<0.7	<1.0
Crosstalk (dB)	<–100	<–90	<–75	<–55
VSWR			<1.2	<1.6

32-Bit Digital Input/Output Module (HP 34522)

Digital sensing and control of your device under test or custom test tools is accommodated with the digital I/O module. Each module provides:

- 32 bi-directional TTL-compatible data lines. The data lines are grouped as four 8-bit ports each with their own handshake lines. The four ports can be configured to handle 8-, 16-, or 32-bit parallel data.
- 8 edge-triggered interrupt lines
- 16 high-power FET outputs furnish switchable high-power current sinks (40V, 500 mA) for actuating external devices
- Read or write rates >40KHz

Breadboard Module (HP 34523)

The breadboard module furnishes a convenient way to incorporate special purpose circuits into your test system. This module lets you interface directly the HP 3235A's backplane control signals and backplane analog and trigger buses.

6½ Digit Multimeter Module (HP 34520)

With the DMM module, you can integrate a high performance system multimeter into your test system without extensive cabling and software programming. The DMM module offers seven functions:

- DC volts with five ranges from 0.03V to 250V and reading rates >1450 rdgs./sec in the 3½ digit mode.
- AC Volts with 1MHz AC Bandwidth
- Two and four-wire resistance measurements
- DC current up to 1.5A, with reading rates as fast as DC Volts and ohms
- AC Current up to 100kHz and 1A.
- Frequency and period from 10 Hz to 1.5MHz with 6½ digit resolution.

The DMM module combines superb analog measurement capability with powerful system flexibility. Measurement inputs can be switched directly from the front of the module or, with the exception of current inputs, from any of the four internal HP 3235 analog buses.

DC Voltage (90 day, Tcal ±5°C)

Range	Best 6½ Digit Accuracy[1] ± (% of reading + volts)	Input Resistance
30mV	.0053% + 5.40 μV	>10 GΩ
300mV	.0038% + 5.7 μV	>10G Ω
3.0V	.003% + 8 μV	>10G Ω
30V	.0048% + 220 μV	10 M Ω± 1%
250V	.0063% + 700 μV	10 M Ω± 1%

DC Current (90 day, Tcal ±5°C)

Range	Best 6½ Digit Accuracy[1] ± (% of reading + amps)	Max. Burden Voltage at Fullscale
300 μA	.025% + 15.4 nA	0.35 V
3mA	.025% + 15.4 nA	0.35 V
30mA	.025% + 1.54 μA	0.35 V
300mA	.088% + 25.4 μA	0.6 V
1.5A	.088% + 654 μA	1 V

Resistance (2 and 4-wire ohms)[2] (90 day, Tcal ±5°C)

Range	Best 6½ Digit Accuracy[1] ± (% of reading + ohms)	Current Output
30Ω	.0078% + 5.4mΩ	1mA
300Ω	.0058% + 5.7mΩ	1mA
3kΩ	.0048% + 9mΩ	1mA
30kΩ	.0048% + 90mΩ	100 μA
300kΩ	.006% + 1Ω	10 μA
3MΩ	.008% + 15Ω	1 μA
30MΩ	.032% + 830Ω	100 nA
300MΩ[3]	2.5% + 100kΩ	100 nA
3GΩ[3]	25% + 1MΩ	100 nA

1. After one hour warm up, integration time 100 PLC. Tcal is the temperature of the calibration environment between 18 and 28°C.
2. For two-wire ohms, add 200MΩ to count error specifications.
3. For two-wire ohms only accuracy is specified following auto-cal (ACAL), under stable conditions (±1°C).

AC Voltage (RMS AC and RMS AC+DC)

ACV Bandwidth: 20 Hz to 1 MHz

Crest Factor: 3.5 to 1 at fullscale

Common Mode Rejection with 1 kΩ imbalance in the low lead, DC to 60 Hz. Guarded: >86dB; non-guarded >66dB.

AC Volts (90 day, Tcal ± 5°C)

Range	(100Hz to 20kHz) Best 5½ Digit Accuracy[1] ± (% of reading + % of range)		Input Impedance
	AC Coupled	DC Coupled	
30mV	.15% + .0441%	.19% + .169%	1MΩ ±1% shunted by <90pF
300mV	.15% + .0441%	.19% + .169%	
3.0V	.15% + .0441%	.19% + .169%	
30V	.15% + .0441%	.19% + .169%	
300V	.21% + .053%	.25% + .203%	

1. Accuracy specified for sine wave inputs, >10% of range. DC component <10% of AC component after one hour warm up and within one week of autocal. AC band set to <400 Hz.

AC Current (RMS AC and RMS AC+DC)

ACI Bandwidth: 20 Hz to 100 kHz
Crest Factor: 3.5 to 1 at fullscale

AC Current (90 day, Tcal ±5°C)

	(100 Hz to 20 kHz) Best 5½ Digit Accuracy[1] ± (% of reading + % of range)	
Range	**AC Coupled**	**DC Coupled**
30mA	.293% + .101%	.35% + .57%
300mA	.293% + .101%	.35% + .57%
1A	.393% + .3%	.45% + 1.71%

1. Accuracy specified for sine wave inputs, > 10% of range. DC component 10% of AC component after one hour warm up and within one week of autocal. AC Band set to <400 Hz.

Frequency and Period: Measures the frequency or period of the AC component of the AC or DC coupled voltage or current input. The counter uses a reciprocal counting technique to give constant resolution independent of input frequency.

Frequency Range: 10 Hz to 1.5 MHz (voltage input)
10 Hz to 100 kHz (current input)

Period Range: .1 s to 667 ns (voltage input)
.1 s to 3.33 us (current input)

Sensitivity: 10 mV RMS or 100 μA RMS (sinewave)

Triggering: Triggers and counts on zero crossings.

Accuracy: (1 year)

Frequency	Period	±% of Reading
10 Hz to 400 Hz	.1 s to 0.25 s	0.05
400 Hz to 1.5 MHz	.025 s to 667 ns	0.01

Measurement Characteristics

	Number of Power Line Cycles (NPLC) 100	10	1	.1	.005	.0005
Maximum No. of Useful Digits	6½	6½	6½	5½	4½	3½
Resolution (No. of Bits)	22	22	22	19	15	12
Resolution (PPM)	.33	.33	.33	3.3	33	330
DCV, DCI, Ω Maximum Reading Rate						
60 Hz	.49	4.9	56	360	1250	1450
50 Hz	.4	4	47	312	1250	1450

Environmental:
Operating Temperature: 0-55 C (32-130 F)
Storage Temperature: –40 –75 C (–40 –165F)
Humidity Range: 95% R.H., 0 to 40 C

Power:
Line Voltage: 90-132V (115V) or 192-264 (230V) switch selectable 47-66 Hz. Fused at 5A (115V) or 2.5A (230V).

Size:
HP 3235 Cardcage: 310mm H (without feet) x 426mm W x 594 mm o (12.25"x16.75"x23.4")
Height with Feet: 325mm (12.8")
Depth with Terminal Blocks: 693mm (27.3")

Weight	Net	Shipping
HP 3235 Cardcage (max.)	21 kg (46 lbs)	28 kg (61 lbs)
Each Module (max.)	5.5 kg (12 lbs)	6.6 kg (14.5 lbs)

Ordering Information

	Price
HP 3235A Switch/Test Unit	$4400
Opt 560 Add System Expansion Card	$350
Opt 570 3-Meter Cable	$150
Opt 590 Add Quick Interconnect	$750
Opt 908 Rack Mount Kit (HP P/N 03235-80908)	$95
HP 3235E Switch/Test Unit Extender	$3700
HP 34550A Control Panel	$550
HP 34551A Control Panel Rack Mount Kit	$50
HP 34560A System Expansion Card	$600

Plug-in Accessories are supplied with your choice of terminal blocks. Specify an "A" suffix if you want to permanently solder your wiring into place. Specify a "B" suffix if you want a quick, non-soldered connection for your system wiring. Specify a "C" suffix to delete the terminal blocks.

32 Channel Relay Multiplexer Module	
HP 34501A (solder-eye lugs)	$1200
HP 34501B (screw-terminals)	$1350
32 Channel Reed Relay Multiplexer Module	
HP 34502A (solder-eye lugs)	$1200
HP 34502B (screw terminals)	$1350
General Purpose Relay Module	
HP 34503A (solder-eye lugs)	$800
HP 34503B (screw-terminals)	$950
Switched-Shield Coaxial Multiplexer Module	
HP 34504A (cable-terminated BNCs)	$1500
HP 34504B (bulkhead BNCs)	$1650
HP 34504C (no terminal block)	$1300
RF Multiplexer Module	
HP 34505A (cable-terminated BNCs)	$1300
HP 34505B (bulkhead BNCs)	$1450
HP 34505C (no terminal block)	$1100
Switched-Shield Coaxial Matrix Module	
HP 34506A (cable-terminated BNCs)	$1700
HP 34506B (bulkhead BNCs)	$1850
HP 34506C (no terminal block)	$1500
32 Channel Mercury-Wetted Reed Relay Module	
HP 34507A (solder-eye lugs)	$1400
HP 34507B (screw-terminals)	$1550
6½ Digit Multimeter Module	
HP 34520A (solder-eye lugs)	$2550
HP 34520B (screw-terminals)	$2600
32 Bit Digital Input/Output Module	
HP 34522A (solder-eye lugs)	$1100
HP 34522B (screw-terminals)	$1250
Breadboard Module	
HP 34523A (solder-eye lugs)	$350
HP 34523B (screw-terminals)	$500
Low Frequency Feedthrough Panel	
HP 34594A (solder-eye lugs)	$300
HP 34594B (screw-terminals)	$450
BNC Feedthrough Panel	
HP 34593A (cable-terminated BNCs)	$325
HP 34593B (bulkhead BNCs)	$475
HP 34593C (no terminal block)	$125
HP 34581A Coaxial Matrix Cabling Kit	$125
HP 34582A Coaxial Matrix Cabling Kit	$200
HP 34585A 50-Ohm Resistive Termination Kit	$80
HP 34591A Quick Interconnect Fixture	$95
HP 34501D Diagnostic Fixture for the HP 34501, 34502, 34507 Multiplexer Modules	$250
HP 34503D General Purpose Relay Diagnostic Fixture	$250
HP 34504D Coaxial Multiplexer Diagnostic Fixture	$400
HP 34505D RF Multiplexer Diagnostic Fixture	$400
HP 34506D Coaxial Matrix Diagnostic Fixture	$400
HP 34522D Digital I/O Diagnostic Fixture	$250