

## 8-16 SPECIFICATIONS

Specifications for the HP 44705A/H, HP 44706A, and HP 44708A/H are given in Table 8-4. Specifications are the performance standards or limits against which the relay multiplexers may be tested.

**NOTE**

*The installation of the HP 44705A/H or HP 44708A/H reduces the maximum allowable analog backplane voltages to  $\pm 170$  V peak between any two points in the circuit or between the circuit and chassis.*

*The installation of the HP 44706A reduces the maximum allowable analog backplane voltages to  $\pm 42$  V peak between any two points in the circuit or between the circuit and chassis.*

**Table 8-4 HP 44705A/05H/06A/08A/08H/17A/18A Specifications**

**HP 44705A 20 Channel Relay Multiplexer**

**Maximum Switch Rate:** 450 channels/second

**Maximum Input Voltage:** 170 V peak or 120 V DC between any two points (Terminal or Chassis)

**Maximum Input Current:** 50 mA non-inductive per channel

**Maximum Input Power:** 1 VA RMS per channel

**Characteristic Relay Lifetime:**

Voltage*	Number of on/off Cycles
10 V peak or 7 V DC	$10^8$
40 V peak or 30 V DC	$1.5 \times 10^7$
100 V peak or 70 V DC	$10^7$

**Input Impedance:**  $>10^9 \Omega$  High to Low, Low to Guard, and Guard to Chassis Terminals

**Bandwidth:** 1.0% flatness at 1 MHz, -3 dB Bandwidth at 10 MHz (50  $\Omega$  source, 1 M $\Omega$  termination)

**Crosstalk:** -70 dB at 100 kHz (channel-to-channel, 50  $\Omega$  source, 1 M $\Omega$  termination)

**Maximum Offset Voltage:** 2  $\mu$ V (between High and Low)

**Maximum Bias Current:**  $\pm 1$  nA DC (Current sourced by High, Low, or Guard to Chassis into Input Terminals or back plane)

**Maximum Wire Size:** 16 AWG

Table 8-4 HP 44705A/05H/06A/08A/08H/17A/18A Specifications (Cont.)

**HP 44705H 20 Channel High Voltage Relay Multiplexer**

- Maximum Switch Rate:** 250 channels/second
- Maximum Input Voltage:** 354 V peak or 250 V DC between any two points (Terminal or Chassis)
- Maximum Input Current:** 50 mA non-inductive per channel (15 mA in Guard Terminal)
- Maximum Input Power:** 1 VA RMS per channel

**Characteristic Relay Lifetime:**

Voltage*	Number of on/off Cycles
10 V peak or 7 V DC	$10^8$
40 V peak or 30 V DC	$1.5 \times 10^7$
100 V peak or 70 V DC	$10^7$
354 V peak (250 V RMS Sine)	$10^6$
200 V DC	$5 \times 10^5$

**Input Impedance:**  $>10^9 \Omega$  High to Low, Low to Guard, and Guard to Chassis Terminals

**Bandwidth:** 1.0% flatness at 1 MHz, -3 dB Bandwidth at 5 MHz (50  $\Omega$  source, 1 M $\Omega$  termination)

**Crosstalk:** -35 dB at 100 kHz (channel-to-channel, 50  $\Omega$  source, 1 M $\Omega$  termination)

**Maximum Offset Voltage:** 10  $\mu$ V (between High and Low)

**Maximum Bias Current:**  $\pm 1$  nA DC (Current sourced by High, Low, or Guard to Chassis into Input Terminals or back plane)

**Maximum Wire Size:** 16 AWG

**HP 44706A 60 Channel Single Ended Relay Multiplexer**

- Maximum Switch Rate:** 450 channels/second
- Maximum Input Voltage:** 42 V peak or 30 V DC between any two points (Terminal or Chassis)
- Maximum Input Current:** 50 mA non-inductive per channel
- Maximum Input Power:** 1 VA RMS per channel

Table 8-4 HP 44705A/05H/06A/08A/08H/17A/18A Specifications (Cont.)

**Characteristic Relay Lifetime:**

Voltage*	Number of on/off Cycles
10 V peak or 7 V DC	$10^8$
40 V peak or 30 V DC	$1.5 \times 10^7$
100 V peak or 70 V DC	$10^7$

**Input Impedance:**  $>10^9 \Omega$  High to Low, Low to Guard, and Guard to Chassis Terminals

**Bandwidth:** 1.0% flatness at 1 MHz, -3 dB Bandwidth at 10 MHz (50  $\Omega$  source, 1 M $\Omega$  termination)

**Crosstalk:** -70 dB at 100 kHz (channel-to-channel, 50  $\Omega$  source, 1 M $\Omega$  termination)

**Maximum Offset Voltage:** 200  $\mu$ V (between High and Low)

**Maximum Bias Current:**  $\pm 1$  nA DC (Current sourced by High, Low, or Guard to Chassis into Input Terminals or back plane)

**Maximum Wire Size:** 16 AWG

**HP 44708A 20 Channel Relay Multiplexer With Thermocouple Compensation**

**Maximum Switch Rate:** 450 channels/second

**Maximum Input Voltage:** 170 V peak or 120 V DC between any two points (Terminal or Chassis)

**Maximum Input Current:** 50 mA non-inductive per channel

**Maximum Input Power:** 1 VA RMS per channel

**Characteristic Relay Lifetime:**

Voltage*	Number of on/off Cycles
10 V peak or 7 V DC	$10^8$
40 V peak or 30 V DC	$1.5 \times 10^7$
100 V peak or 70 V DC	$10^7$

**Input Impedance:**  $>10^9 \Omega$  High to Low, Low to Guard, and Guard to Chassis Terminals

**Bandwidth:** 1.0% flatness at 1 MHz, -3 dB Bandwidth at 10 MHz (50  $\Omega$  source, 1 M $\Omega$  termination)

**Crosstalk:** -70 dB at 100 kHz (channel-to-channel, 50  $\Omega$  source, 1 M $\Omega$  termination)

Table 8-4 HP 44705A/05H/06A/08A/08H/17A/18A Specifications (Cont.)

**Maximum Offset Voltage:** 2  $\mu$ V (between High and Low)

**Maximum Bias Current:**  $\pm$ 1 nA DC (Current sourced by High, Low, or Guard to Chassis into Input Terminals or back plane)

**Maximum Wire Size:** 16 AWG

**Ref. Junction Compensation Accuracy:** 0.1  $^{\circ}$ C (over 18 to 28  $^{\circ}$ C operating temperature)

**Max Temperature Difference Across Isothermal Module:** 0.2  $^{\circ}$ C

HP 44708H 20 Channel High Voltage Relay Multiplexer  
with Thermocouple Compensation

**Maximum Switch Rate:** 250 channels/second

**Maximum Input Voltage:** 354 V peak or 250 V DC between any two points (Terminal or Chassis)

**Maximum Input Current:** 50 mA non-inductive per channel (15 mA in Guard Terminal)

**Maximum Input Power:** 1 VA RMS per channel

**Characteristic Relay Lifetime:**

Voltage*	Number of on/off Cycles
10 V peak or 7 V DC	$10^8$
40 V peak or 30 V DC	$1.5 \times 10^7$
100 V peak or 70 V DC	$10^7$
354 V peak 250 V RMS (sine)	$10^6$
200 V DC	$5 \times 10^5$

**Input Impedance:**  $>10^9 \Omega$  High to Low, Low to Guard, and Guard to Chassis Terminals

**Bandwidth:** 1.0% flatness at 1 MHz, -3 dB Bandwidth at 5 MHz (50  $\Omega$  source, 1 M $\Omega$  termination)

**Crosstalk:** -35 dB at 100 kHz (channel-to-channel, 50  $\Omega$  source, 1 M $\Omega$  termination)

**Maximum Offset Voltage:** 10  $\mu$ V (between High and Low)

**Maximum Bias Current:**  $\pm$ 1 nA DC (Current sourced by High, Low, or Guard to Chassis into Input Terminals or back plane)

**Maximum Wire Size:** 16 AWG

Table 8-4 HP 44705A/05H/06A/08A/08H/17A/18A Specifications (Cont.)

**Ref. Junction Compensation Accuracy:** 0.1 °C (over 18 to 28 °C operating temperature)

**Max Temperature Difference Across Isothermal Module:** 0.2 °C

**HP 44717A/44718A 10 Bridge Static Strain Gage Multiplexer\*\***  
(Use HP 44705A Specifications with these changes/additions)

**Maximum Input Voltage:** 42 V peak or 30 V DC between High and Low  
170 V peak or 120 V DC between any other two points (Terminal or Chassis)

**Strain Gage Resolution:**

Bridge Configuration	Bridge Excitation Voltage		
	5 V	1 V	0.1 V
Full	0.01 $\mu\epsilon$	0.05 $\mu\epsilon$	0.5 $\mu\epsilon$
1/2	0.02 $\mu\epsilon$	0.1 $\mu\epsilon$	1 $\mu\epsilon$
1/4	0.04 $\mu\epsilon$	0.2 $\mu\epsilon$	2 $\mu\epsilon$

**Bridge Excitation Requirements:** An inexpensive power supply, such as an HP 6214B can be used for the following requirements

Current Requirements for Excitation Voltage (5.4 V maximum for specified accuracy):

Bridge Type	Bridge Configuration	Current per Channel
120 $\Omega$	Full	50 mA
120 $\Omega$	1/2	25 mA
120 $\Omega$	1/4	25 mA
350 $\Omega$	Full	17 mA
350 $\Omega$	1/2	8.5 mA
350 $\Omega$	1/4	8.5 mA

Ripple and Noise Requirements for Excitation Voltage:

1 mV peak-to-peak (20 Hz to 20 MHz)

**Max Self-Heating Offset Due to Change in number of Gages on One Assembly:** 2  $\mu\epsilon$  per Gage for 120  $\Omega$ , 1/4 Bridge Configuration, and 5 V Excitation Voltage (worst-case)

**Max Self-Heating Offset Due to a 0.1 V Change in Excitation Voltage:** 0.38  $\mu\epsilon$

\*The voltage in the table is the total peak voltage between one scanned channel contact and the next, or from a scanned channel contact to 0 volts (i.e., chassis).

\*\*Applies to HP 3852As with firmware revision 2.0 or above.