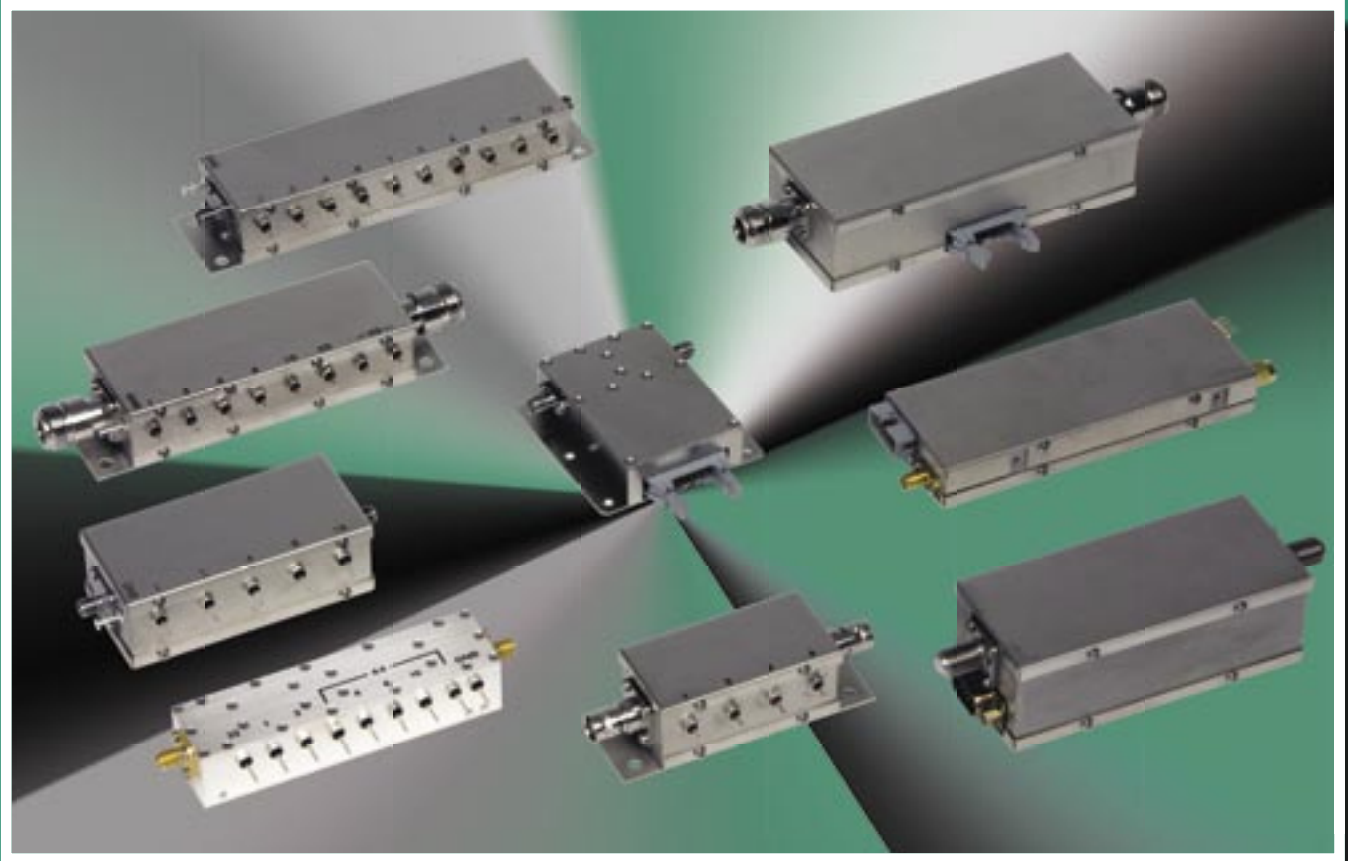


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Programmable Attenuators

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50P-686 SMA).

Solid State - 50 Ohm			
Model Number	Frequency Range	Attenuation Range (dB)	Page
50P-686	20-1000 MHz	0-127 x 1	2-5
50P-853	500-1000 MHz	0-63 x 1	2-9
50P-1080	3-1215 MHz	0-127 x 1	2-5
50P-1130	1-200 MHz	0-63.5 x 0.5	2-9
50P-1225	400-2200 MHz	0-63.5 x 0.5	2-4
50P-1226	400-2200 MHz	0-127 x 1	2-4
50P-1321	500-2500 MHz	0-127 x 1	2-4
50P-1501	200-3000 MHz	0-127 x 1	2-4
50P-1571	20-1000 MHz	0-63.5 x 0.5	2-9
50P-1621	20-500 MHz	0-63 x 1	2-9
50P-1761	800-2200 MHz	0-63 x 1	2-7
50P-1762	800-2400 MHz	0-63 x 1	2-7
50P-1763	800-2200 MHz	0-31.5 x 0.5	2-7
50P-1764	10-1000 MHz	0-31 x 1	2-7
50P-1765	700-3000 MHz	0-31 x 1	2-7
50P-1767	400-3000 MHz	0-70 x 10	2-8
50P-1768	30-2500 MHz	0-55 x 5	2-8
50P-1769	800-2200 MHz	0-1.5 x 0.1	2-8
50P-1778	800-2200 MHz	0-127 x 1	2-6
50P-1779	800-2400 MHz	0-127 x 1	2-6
50P-1780	500-2500 MHz	0-127 x 1	2-6
50P-1781	800-3000 MHz	0-127 x 1	2-6
50P-1782	15-2000 MHz	0-127 x 1	2-6
50P-1853	200-6000 MHz	0-63 x 1	2-10
50P-1857	200-6000 MHz	0-95 x 1	2-10
50P-1867	30-3000 MHz	0-31.75 x 0.25	2-10
50P-1891	30-3000 MHz	0-63.5 x 0.5	2-10
50P-1893	30-3000 MHz	0-63 x 1	2-10

Solid State - 75 Ohm			
Model Number	Frequency Range	Attenuation Range (dB)	Page
75P-141	900-2150 MHz	0-63 x 1	2-13
75P-153	20-1000 MHz	0-63.5 x 0.5	2-13
75P-168	50-2000 MHz	0-63 x 1	2-12
75P-173	450-2150 MHz	0-127 x 1	2-12

Analog - 50 Ohm			
Model Number	Frequency Range	Attenuation Range	Page
50AP-002	10-500 MHz	0-30 dB	2-14
50AP-077	50-2200 MHz	0-20 dB	2-14

Analog - 75 Ohm			
Model Number	Frequency Range	Attenuation Range	Page
75AP-001	10-500 MHz	0-30 dB	2-14

Relay - 50 Ohm			
Model Number	Frequency Range	Attenuation Range (dB)	Page
50P-033	DC-1500 MHz	0-10 x 1	2-15
50P-034	DC-1500 MHz	0-100 x 10	2-15
50P-076	DC-1000 MHz	0-127 x 1	2-17
50P-077	DC-1000 MHz	0-63 x 1	2-16
50P-542	DC-2800 MHz	0-10 x 1	2-15
50P-591	DC-3000 MHz	0-85 x 1	2-17
50P-766	DC-5000 MHz	0-70 x 10	2-23
50P-847	DC-5000 MHz	0-15 x 1	2-23
50P-975	DC-1000 MHz	0-63 x 1	2-19
50P-990	DC-2500 MHz	0-31.5 x 0.5	2-16
50P-1126	DC-1000 MHz	0-31.5 x 0.5	2-19
50P-1128	DC-2000 MHz	0-63.75 x 0.25	2-17
50P-1161	DC-1000 MHz	0-6.3 x 0.1	2-19
50P-1202	DC-1600 MHz	0-63 x 1	2-19
50P-1208	DC-2500 MHz	0-15 x 1	2-20
50P-1209	DC-2500 MHz	0-15.5 x 0.5	2-20
50P-1210	DC-2500 MHz	0-31 x 1	2-20
50P-1211	DC-2500 MHz	0-31.5 x 0.5	2-20
50P-1212	DC-2500 MHz	0-63 x 1	2-20
50P-1304	DC-500 MHz	0-75 x 5	2-21
50P-1436	DC-2500 MHz	0-127 x 1	2-22
50P-1516	DC-6000 MHz	0-70 x 10	2-23
50P-1633	DC-1000 MHz	0-64.5 x 0.1	2-18
50P-1634	DC-2500 MHz	0-50 x 10	2-21
50P-1683	DC-2500 MHz	0-70 x 10	2-21
50P-1696	DC-2500 MHz	0-63 x 1	2-22
50P-1705	DC-200 MHz	0-64.5 x 0.1	2-18
50P-1758	DC-1000 MHz	0-95 x 1	2-21

Relay - 75 Ohm			
Model Number	Frequency Range	Attenuation Range (dB)	Page
75P-022	DC-1000 MHz	0-63 x 1	2-24
75P-033	DC-1000 MHz	0-127 x 1	2-25
75P-089	DC-500 MHz	0-63.75 x 0.25	2-25
75P-093	DC-1000 MHz	0-110 x 10	2-24
75P-157	DC-1000 MHz	0-95.5 x 0.5	2-26
75P-163	DC-1000 MHz	0-63.75 x 0.25	2-26

Programmable Attenuators

Model Number Index

Please add connector type to the end of part number to complete model number (Example: 50P-686 SMA).

Solid State - 50 Ohm			
Attenuation Range (dB)	Frequency Range	Model Number	Page
0-1.5 x 0.1	800-2200 MHz	50P-1769	2-8
0-31 x 1	10-1000 MHz	50P-1764	2-7
0-31 x 1	700-3000 MHz	50P-1765	2-7
0-31.5 x 0.5	800-2200 MHz	50P-1763	2-7
0-31.75 x 0.25	30-3000 MHz	50P-1867	2-10
0-55 x 5	30-2500 MHz	50P-1768	2-8
0-63 x 1	20-500 MHz	50P-1621	2-9
0-63 x 1	500-1000 MHz	50P-853	2-9
0-63 x 1	800-2200 MHz	50P-1761	2-7
0-63 x 1	800-2400 MHz	50P-1762	2-7
0-63 x 1	200-6000 MHz	50P-1853	2-10
0-63 x 1	30-3000 MHz	50P-1893	2-10
0-63.5 x 0.5	1-200 MHz	50P-1130	2-9
0-63.5 x 0.5	20-1000 MHz	50P-1571	2-9
0-63.5 x 0.5	400-2200 MHz	50P-1225	2-4
0-63.5 x 0.5	30-3000 MHz	50P-1891	2-10
0-70 X 10	400-3000 MHz	50P-1767	2-8
0-95 x 1	200-6000 MHz	50P-1857	2-10
0-127 x 1	3-1215 MHz	50P-1080	2-5
0-127 x 1	15-2000 MHz	50P-1782	2-6
0-127 x 1	20-1000 MHz	50P-686	2-5
0-127 x 1	200-3000 MHz	50P-1501	2-4
0-127 x 1	400-2200 MHz	50P-1226	2-4
0-127 x 1	500-2500 MHz	50P-1321	2-4
0-127 x 1	500-2500 MHz	50P-1780	2-6
0-127 x 1	800-2200 MHz	50P-1778	2-6
0-127 x 1	800-2400 MHz	50P-1779	2-6
0-127 x 1	800-3000 MHz	50P-1781	2-6

Solid State - 75 Ohm			
Attenuation Range (dB)	Frequency Range	Model Number	Page
0-63 x 1	900-2150 MHz	75P-141	2-13
0-63 x 1	50-2000 MHz	75P-168	2-12
0-63.5 x 0.5	20-1000 MHz	75P-153	2-13
0-127 x 1	450-2150 MHz	75P-173	2-12

Analog - 50 Ohm			
Attenuation Range	Frequency Range	Model Number	Page
0-20 dB	50-2200 MHz	50AP-077	2-14
0-30 dB	10-500 MHz	50AP-002	2-14

Analog - 75 Ohm			
Attenuation Range	Frequency Range	Model Number	Page
0-30 dB	10-500 MHz	75AP-001	2-14

Relay - 50 Ohm			
Attenuation Range (dB)	Frequency Range	Model Number	Page
0-6.3 x 0.1	DC-1000 MHz	50P-1161	2-19
0-10 x 1	DC-1500 MHz	50P-033	2-15
0-10 x 1	DC-2800 MHz	50P-542	2-15
0-15 x 1	DC-2500 MHz	50P-1208	2-20
0-15 x 1	DC-5000 MHz	50P-847	2-23
0-15.5 x 0.5	DC-2500 MHz	50P-1209	2-20
0-31 x 1	DC-2500 MHz	50P-1210	2-20
0-31.5 x 0.5	DC-1000 MHz	50P-1126	2-19
0-31.5 x 0.5	DC-2500 MHz	50P-990	2-16
0-31.5 x 0.5	DC-2500 MHz	50P-1211	2-20
0-50 x 10	DC-2500 MHz	50P-1634	2-21
0-63 x 1	DC-1000 MHz	50P-077	2-16
0-63 x 1	DC-1000 MHz	50P-975	2-19
0-63 x 1	DC-1600 MHz	50P-1202	2-19
0-63 x 1	DC-2500 MHz	50P-1212	2-20
0-63 x 1	DC-2500 MHz	50P-1696	2-22
0-63.75 x 0.25	DC-2000 MHz	50P-1128	2-17
0-64.5 x 0.1	DC-200 MHz	50P-1705	2-18
0-64.5 x 0.1	DC-1000 MHz	50P-1633	2-18
0-70 x 10	DC-5000 MHz	50P-766	2-23
0-70 x 10	DC-6000 MHz	50P-1516	2-23
0-70 x 10	DC-2500 MHz	50P-1683	2-21
0-75 x 5	DC-500 MHz	50P-1304	2-21
0-85 x 1	DC-3000 MHz	50P-591	2-17
0-95 x 1	DC-1000 MHz	50P-1758	2-21
0-100 x 10	DC-1500 MHz	50P-034	2-15
0-127 x 1	DC-1000 MHz	50P-076	2-17
0-127 x 1	DC-2500 MHz	50P-1436	2-22

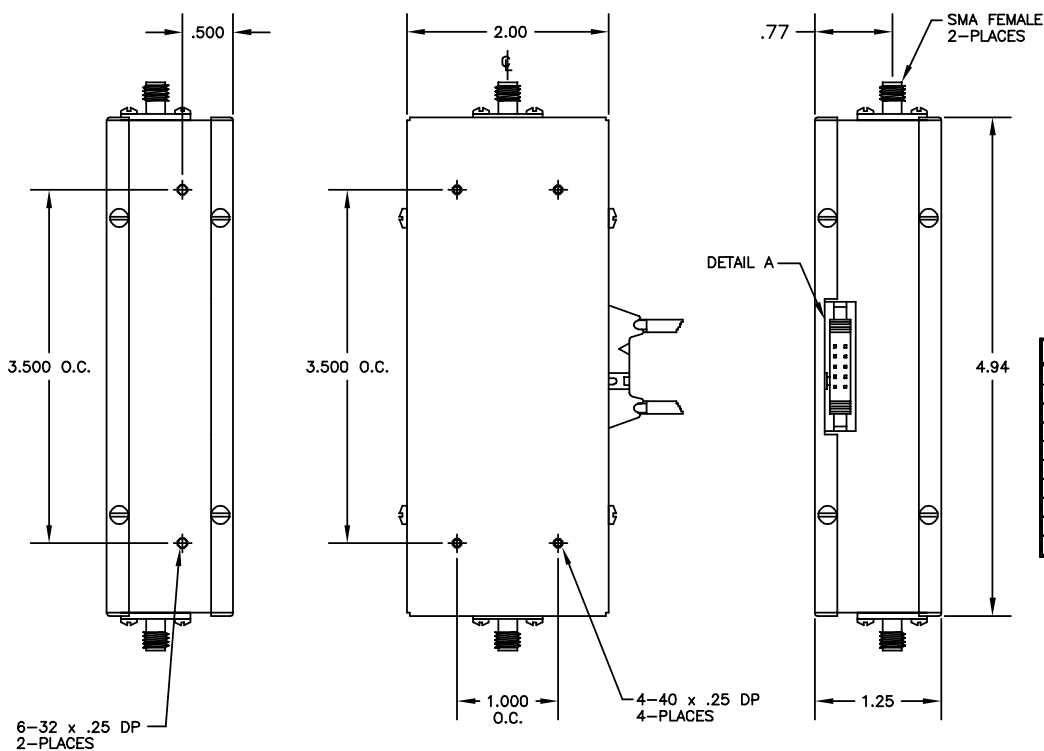
Relay - 75 Ohm			
Attenuation Range (dB)	Frequency Range	Model Number	Page
0-63 x 1	DC-1000 MHz	75P-022	2-24
0-63.75 x 0.25	DC-500 MHz	75P-089	2-25
0-63.75 x 0.25	DC-1000 MHz	75P-163	2-26
0-95.5 x 0.5	DC-1000 MHz	75P-157	2-26
0-110 x 10	DC-1000 MHz	75P-093	2-24
0-127 x 1	DC-1000 MHz	75P-033	2-25

Solid State Programmable Attenuators

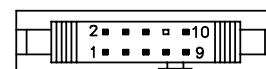
Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1225	400-2200 MHz	0-63.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	+/- 0.25 dB 0.5, 1, 2, 4, 8 dB +/- 0.35 dB 16 and 32 dB Accumulated Error +/- 0.5 dB or 2%	1.5:1	4 dB maximum
50P-1226	400-2200 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.5 dB or 2%	1.5:1	4.5 dB maximum
50P-1321	500-2500 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.5 dB or 2%	1.6:1	5 dB maximum 2 dB typical @ 500 MHz 4 dB typical @ 2500 MHz
50P-1501	200-3000 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	1, 2, 4, 8 dB +/- 0.25 dB 200-2000 MHz 1, 2, 4, 8 dB +/- 0.4 dB 2000-3000 MHz 16, 32, 64 dB +/- 0.5 dB or 2% 200-3000 MHz	1.5:1	3.5 dB maximum to 1000 MHz 6.0 dB maximum to 3000 MHz

Common Specifications

Impedance	Switching Speed (maximum)	RF Input Power	DC Supply (nominal)	Control Logic (7 lines)	Operating Temperature	RF Connectors
50 Ohms	2 microseconds	+20 dBm operating +30 dBm no damage	+5 Vdc @ 300 mA	TTL low for Thru Path TTL high for attenuation	0° C to +70° C	SMA, N, BNC, TNC



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DETAIL A
3M# 3793-5303

PIN	50P-1225	50P-1226/1321/1501
1	.5dB TTL CONTROL	1dB TTL CONTROL
2	1dB TTL CONTROL	2dB TTL CONTROL
3	2dB TTL CONTROL	4dB TTL CONTROL
4	4dB TTL CONTROL	8dB TTL CONTROL
5	8dB TTL CONTROL	16dB TTL CONTROL
6	16dB TTL CONTROL	32dB TTL CONTROL
7	32dB TTL CONTROL	64dB TTL CONTROL
8	NO CONNECTION	NO CONNECTION
9	+5 Vdc	+5 Vdc
10	GROUND	GROUND

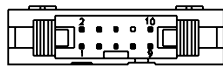
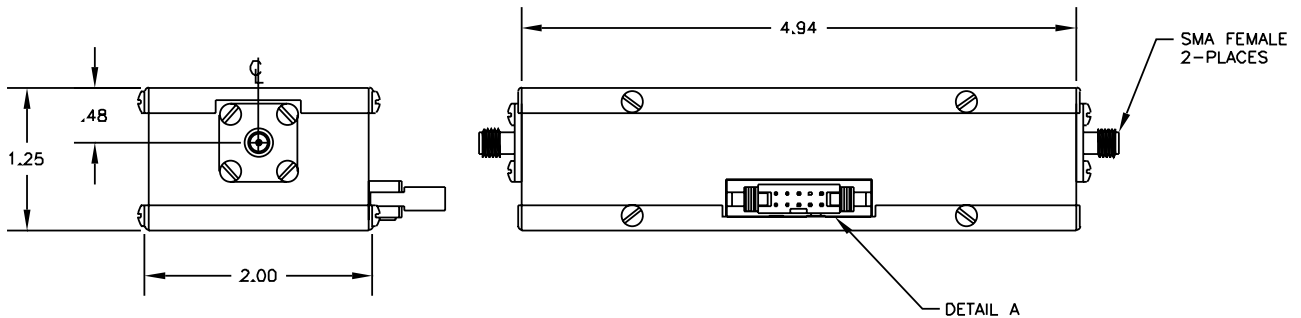
For a DC mating cable,
see page 8-12.

Solid State Programmable Attenuators

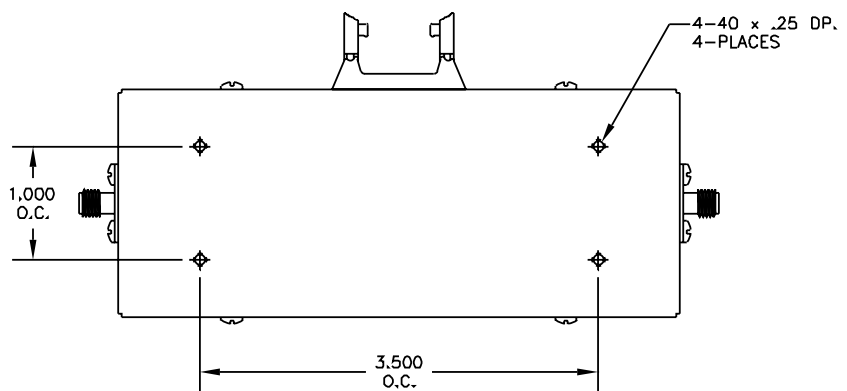
Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss	Operating Temperature
50P-686	20-1000 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.2 dB or 2% 20-500 MHz +/- 0.4 dB or 2% 500-1000 MHz	1.4:1	3 dB nominal 4 dB maximum	0° C to +70° C
50P-1080	3-1215 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.2 dB or 2% 3-500 MHz +/- 0.4 dB or 2% 500-1215 MHz	1.4:1	3 dB nominal 4 dB maximum Flatness +/- 0.75 dB maximum	0° C to +70° C

Common Specifications

Impedance	Switching Speed	RF Input Power	DC Supply (nominal)	Control Logic (7 lines)	RF Connectors
50 Ohms	5 microseconds	+10 dBm	+5 Vdc @ 300 mA	TTL low for Thru Path TTL high for attenuation	SMA, N, BNC, or TNC



DETAIL A
3M# 3793-5303



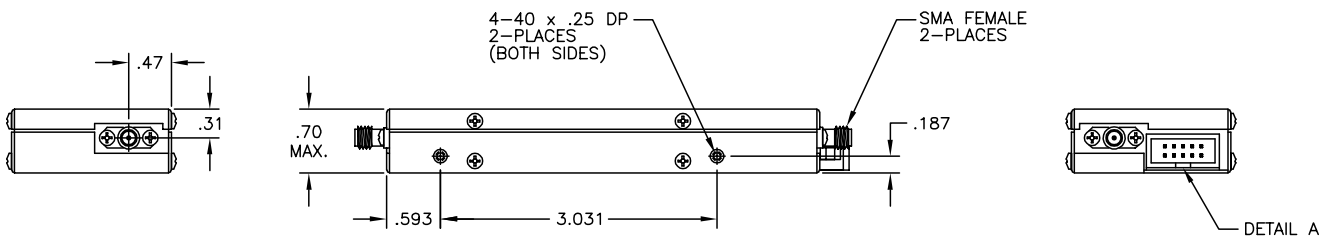
PIN	FUNCTION
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	32dB TTL CONT.
7	64dB TTL CONT.
8	
9	+5Vdc
10	GROUND

For a DC mating cable, see page 8-12.

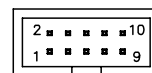
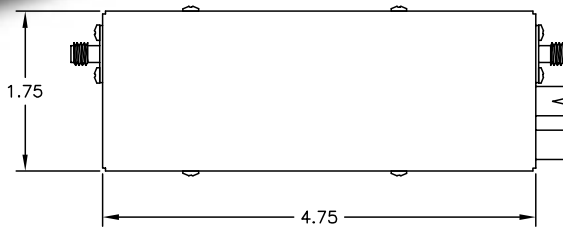
Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss	Switching Speed
50P-1778	800-2200 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.3 dB or 2%	1.4:1	5.2 dB maximum 3.1 dB typical @ 800 MHz 4.8 dB typical @ 2200 MHz	5 microseconds
50P-1779	800-2400 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.3 dB or 2%	1.4:1	4.5 dB maximum 2.0 dB typical @ 800 MHz 4.0 dB typical @ 2400 MHz	5 microseconds
50P-1780	500-2500 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.5 dB or 2%	1.5:1	4.5 dB maximum	5 microseconds
50P-1781	800-3000 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.6 dB or 2%	1.5:1	6.0 dB maximum	5 microseconds
50P-1782	15-2000 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.4 dB or 2%	1.5:1	6 dB maximum 2.0 dB typical @ 15 MHz 5.5 dB typical @ 2000 MHz	10 microseconds

Model	Impedance	RF Input Power	DC Supply (nominal)	Control Logic (7 lines)	RF Connectors						
50P-1778	50 Ohms	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 250 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female						
50P-1779	50 Ohms	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 250 mA -5 Vdc @ 250 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female						
50P-1780	50 Ohms	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 250 mA -5 Vdc @ 250 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female						
50P-1781	50 Ohms	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 150 mA -5 Vdc @ 150 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female </tr <tr> <td>50P-1782</td> <td>50 Ohms</td> <td>+10 dBm operating +30 dBm (no damage)</td> <td>+5 Vdc @ 300 mA</td> <td>TTL Low for Thru Path TTL High for Attenuation</td> <td>SMA female</td> </tr>	50P-1782	50 Ohms	+10 dBm operating +30 dBm (no damage)	+5 Vdc @ 300 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female
50P-1782	50 Ohms	+10 dBm operating +30 dBm (no damage)	+5 Vdc @ 300 mA	TTL Low for Thru Path TTL High for Attenuation	SMA female						



For a DC mating cable, see page 8-12.



DETAIL A
T&B #609-1057

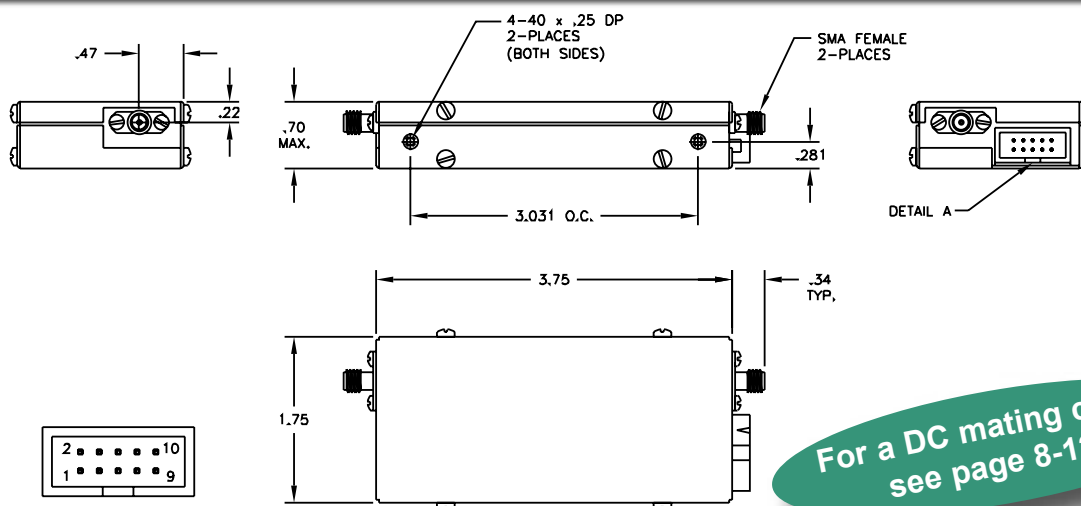
PIN	50P-1779/1780/1781	PIN	50P-1778/1782
1	1 dB TTL CONT.	1	1 dB TTL CONT.
2	2 dB TTL CONT.	2	2 dB TTL CONT.
3	4 dB TTL CONT.	3	4 dB TTL CONT.
4	8 dB TTL CONT.	4	8 dB TTL CONT.
5	16 dB TTL CONT.	5	16 dB TTL CONT.
6	32 dB TTL CONT.	6	32 dB TTL CONT.
7	64 dB TTL CONT.	7	64 dB TTL CONT.
8	-5 Vdc	8	NO CONNECTION
9	+5 Vdc	9	+5 Vdc
10	GROUND	10	GROUND

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Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss	Operating Temperature
50P-1761	800-2200 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.25 dB or 2%	1.5:1	2.0 dB nominal @ 800 MHz 3.5 dB nominal @ 2200 MHz	0° C to +70° C
50P-1762	800-2400 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.3 dB or 2%	1.5:1	3.6 dB maximum 1.6 dB typical @ 800 MHz 3.0 dB typical @ 2400 MHz	0° C to +70° C
50P-1763	800-2200 MHz	0-31.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8 and 16 dB	+/- 0.3 dB or 2%	1.5:1	2 dB nominal @ 800 MHz 4 dB nominal @ 2200 MHz	0° C to +70° C
50P-1764	10-1000 MHz	0-31 dB x 1 dB/ 1, 2, 4, 8 and 16 dB	+/- 0.2 dB or 2%	1.5:1	2.5 dB maximum 1.1 dB typical @ 10 MHz 1.9 dB typical @ 1000 MHz	0° C to +70° C
50P-1765	700-3000 MHz	0-31 dB x 1 dB/ 1, 2, 4, 8, and 16 dB	+/- 0.5 dB or 2%	1.5:1	3.0 dB maximum 1.1 dB typical @ 700 MHz 2.3 dB typical @ 3000 MHz	0° C to +70° C

Model	Switching Speed	RF Input Power	DC Supply (nominal)	Control Logic	Impedance	RF Connectors
50P-1761	5 microseconds	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 250 mA	(6 lines) TTL Low for Thru Path TTL High for Attenuation	50 Ohms	SMA female
50P-1762	5 microseconds	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 250 mA	(6 lines) TTL Low for Thru Path TTL High for Attenuation	50 Ohms	SMA female
50P-1763	5 microseconds	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 250 mA	(6 lines) TTL Low for Thru Path TTL High for Attenuation	50 Ohms	SMA female
50P-1764	5 microseconds maximum 1 microsecond typical	+10 dBm operating +30 dBm (no damage)	+5 Vdc @ 100 mA	(5 lines) TTL Low for Thru Path TTL High for Attenuation	50 Ohms	SMA female
50P-1765	5 microseconds maximum 3 microseconds typical	+20 dBm operating +24 dBm (1 dB compression)	+5 Vdc @ 150 mA -5 Vdc @ 100 mA	(5 lines) TTL Low for Thru Path TTL High for Attenuation	50 Ohms	SMA female



DETAIL A
T&B #609-1057

For a DC mating cable, see page 8-12.

PIN	50P-1761/1762
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	32dB TTL CONT.
7	NO CONNECTION
8	NO CONNECTION
9	+5 Vdc
10	GROUND

PIN	50P-1763
1	.5dB TTL CONT.
2	1dB TTL CONT.
3	2dB TTL CONT.
4	4dB TTL CONT.
5	8dB TTL CONT.
6	16dB TTL CONT.
7	NO CONNECTION
8	NO CONNECTION
9	+5 Vdc
10	GROUND

PIN	50P-1764
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	NO CONNECTION
7	NO CONNECTION
8	NO CONNECTION
9	+5 Vdc
10	GROUND

PIN	50P-1765
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	NO CONNECTION
7	NO CONNECTION
8	-5 Vdc
9	+5 Vdc
10	GROUND

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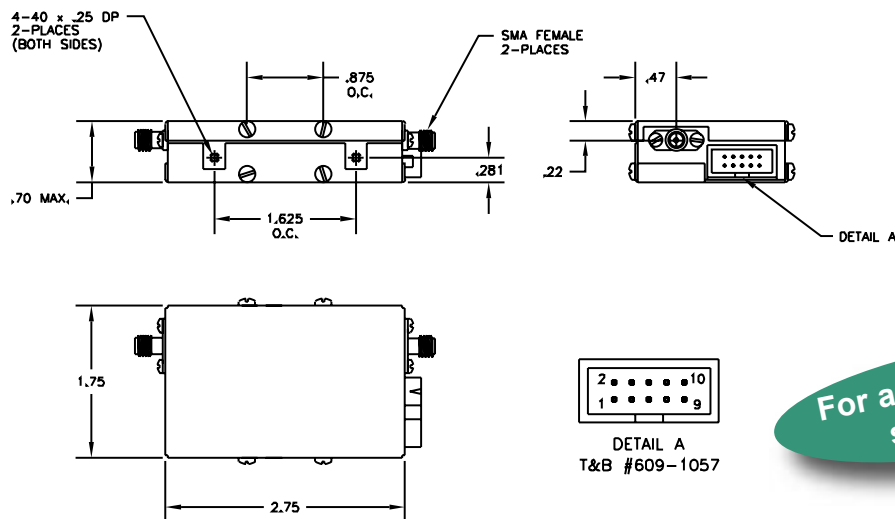
Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	Insertion Loss
50P-1767	400-3000 MHz	0-70 dB x 10 dB/ 10, 20 and 40 dB	+/- 0.5 dB or 2%	0.75 dB nominal @ 400 MHz 2.0 dB nominal @ 3000 MHz
50P-1768	30-2500 MHz	0-55 dB x 5 dB/ 5, 10, 20, and 20 dB	+/- 0.3 dB or 1% 30-500 MHz +/- 0.5 dB or 2% 500-2500 MHz	1.5 dB typical at 30 MHz 4.0 dB typical at 2500 MHz 4.5 dB maximum
50P-1769	800-2200 MHz	0-1.5 dB x 0.1 dB/ 0.1, 0.2, 0.4, and 0.8 dB	0.1 dB +/- 0.05 dB 0.2 dB +/- 0.075 dB 0.4 dB +/- 0.1 dB 0.8 dB +/- 0.2 dB	0.5 dB nominal 1.0 dB maximum

Model	VSWR	Switching Speed	RF Input Power	DC Supply (nominal)	Control Logic
50P-1767	1.5:1 typical 1.6:1 maximum	1 microsecond	+10 dBm operating +17 dBm (1 dB compression)	+5 Vdc @ 70 mA	(3 lines) TTL Low for Thru Path TTL High for Attenuation
50P-1768	1.5:1 maximum	5 microseconds	+10 dBm operating +30 dBm (no damage)	+5 Vdc @ 70 mA	(4 lines) TTL Low for Thru Path TTL High for Attenuation
50P-1769	1.5:1 maximum	5 microseconds	+20 dBm operating +30 dBm (no damage)	+5 Vdc @ 15 mA	(4 lines) TTL Low for Thru Path TTL High for Attenuation

Common Specifications

Impedance	Operating Temperature	RF Connector
50 Ohms	0° C to +70° C	SMA female



For a DC mating cable,
see page 8-12.

	50P-1767	50P-1768	50P-1769
PIN	FUNCTION	FUNCTION	FUNCTION
1	10dB TTL CONTROL	5dB TTL CONTROL	0.1dB TTL CONTROL
2	20dB TTL CONTROL	10dB TTL CONTROL	0.2dB TTL CONTROL
3	40dB TTL CONTROL	20dB TTL CONTROL	0.4dB TTL CONTROL
4	NO CONNECTION	20dB TTL CONTROL	0.8dB TTL CONTROL
5	NO CONNECTION	NO CONNECTION	NO CONNECTION
6	NO CONNECTION	NO CONNECTION	NO CONNECTION
7	NO CONNECTION	NO CONNECTION	NO CONNECTION
8	NO CONNECTION	NO CONNECTION	NO CONNECTION
9	+XX Vdc	+XX Vdc	+XX Vdc
10	GROUND	GROUND	GROUND

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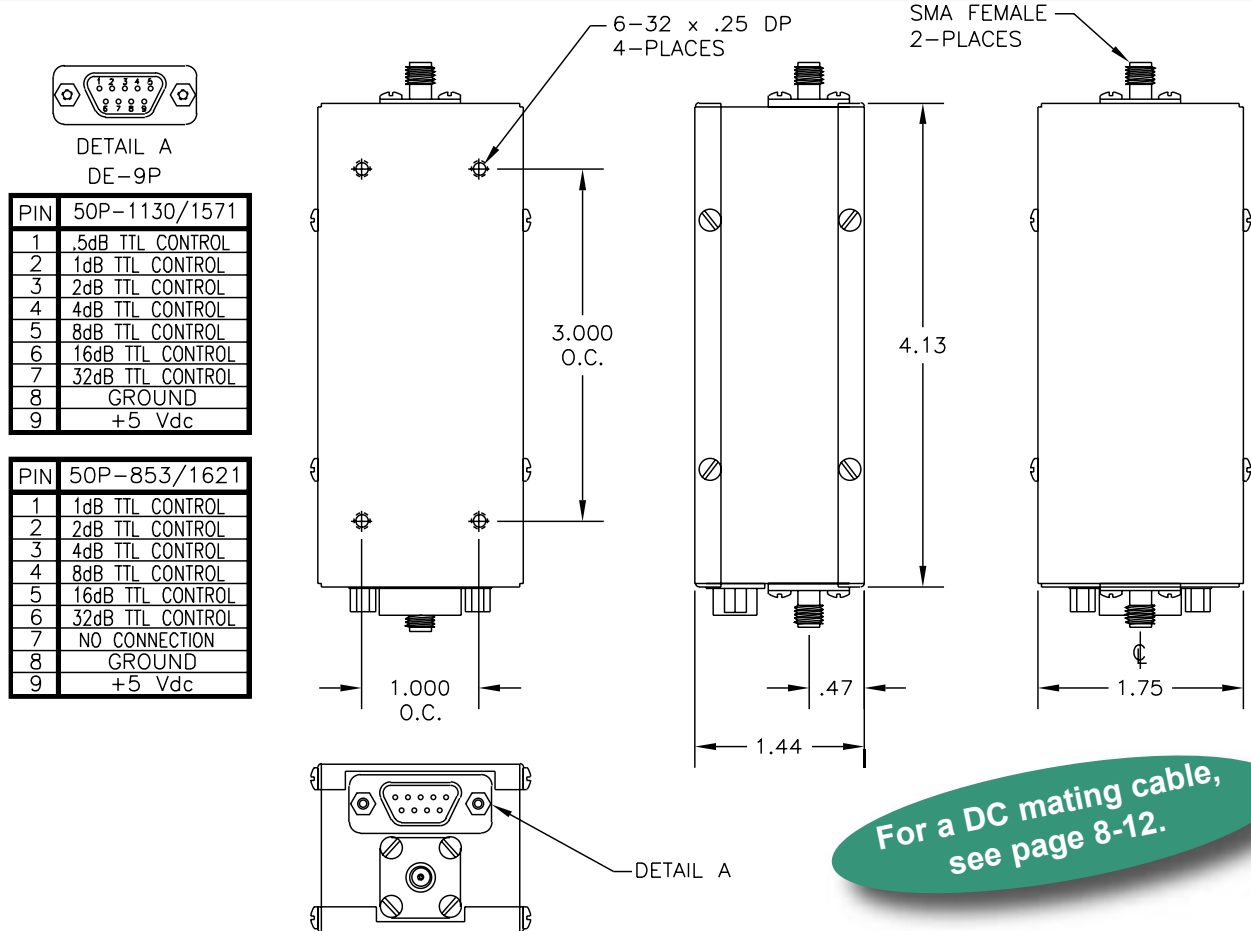
Solid State Programmable Attenuators

Phase Constant

Phase Constant

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss	RF Input Power
50P-853	500-1000 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.5 dB or 1%	1.4:1	3.0 dB maximum	+10 dBm
50P-1130	1-200 MHz	0-63.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	+/- 0.3 dB or 1%	1.5:1	4.0 dB maximum	+10 dBm
50P-1571	20-1000 MHz	0-63.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	+/- 0.3 dB or 1% 20-300 MHz +/- 0.3 dB or 2% 300-800 MHz +/- 0.4 dB or 2% 800-1000 MHz	1.4:1	2.5 dB nominal 3.5 dB maximum	+10 dBm
50P-1621	20-500 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.5 dB or 2%	1.5:1	3.0 dB maximum	+10 dBm

Model	Impedance	Switching Speed	DC Supply (nominal)	Phase Shift (maximum)	Control Logic	RF Connectors
50P-853	50 Ohms	5 microseconds	+5 Vdc @ 300 mA	N/A	TTL low for Thru Path TTL high for attenuation	BNC, SMA, N or TNC female
50P-1130	50 Ohms	20 microseconds	+5 Vdc @ 300 mA	+/- 3° @ any setting	TTL low for Thru Path TTL high for attenuation	BNC, SMA, N or TNC female
50P-1571	50 Ohms	2 microseconds	+5 Vdc @ 200 mA	N/A	TTL low for Thru Path TTL high for attenuation	BNC, SMA, N or TNC female
50P-1621	50 Ohms	2.0 microseconds maximum 1.5 microseconds typical	+5 Vdc @ 250 mA	+/- 5° @ any setting	TTL low for Thru Path TTL high for attenuation	BNC, SMA, N or TNC female



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Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1853	200-6000 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16, and 32 dB	+/- 0.50 dB 1-7 dB +/- 1.00 dB 8-11 dB +/- 1.25 dB or 4% 12-63 dB	1.8:1 200-800 MHz 1.5:1 800-6000 MHz	5.5 dB maximum 2.6 dB typical @ 200 MHz 3.0 dB typical @ 800 MHz 3.5 dB typical @ 2000 MHz 5.0 dB typical @ 6000 MHz
50P-1857	200-6000 MHz	0-95 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 32 dB	+/- 0.50 dB 1-7 dB +/- 1.00 dB 8-11 dB +/- 1.25 dB or 4% 12-95 dB	2.0:1	8 dB maximum 3.7 dB typical @ 200 MHz 4.0 dB typical @ 800 MHz 4.8 dB typical @ 2000 MHz 7.5 dB typical @ 6000 MHz
50P-1867	30-3000 MHz	0-31.75 dB x 0.25 dB/ 0.25, 0.5, 1, 2, 4, 8 and 16 dB	+/- 0.10 dB 0.25-3.75 dB +/- 0.25 dB 4.0-7.75 dB +/- 0.50 dB or 4% 8.0-31.75 dB	1.5:1	2.5 dB maximum 1.3 dB typical @ 30 MHz 2.2 dB typical @ 3000 MHz
50P-1891	30-3000 MHz	0-63.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	+/- 0.2 dB 0.5-7.5 dB +/- 0.5 dB or 2% 8.0-63.5 dB	1.8:1 30-800 MHz 1.5:1 800-3000 MHz	4.0 dB maximum 2.5 dB typical @ 30 MHz 3.7 dB typical @ 3000 MHz
50P-1893	30-3000 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.2 dB 1-7 dB +/- 0.5 dB or 2% 8-63 dB	1.8:1 30-800 MHz 1.5:1 800-3000 MHz	4.0 dB maximum 2.5 dB typical @ 30 MHz 3.7 dB typical @ 3000 MHz

Model	Impedance	Switching Speed	RF Input Power	Control Logic	Operating Temperature	RF Connector	DC Supply (nominal)
50P-1853	50 Ohms	1 microsecond	+20 dBm operating +25 dBm (no damage)	(6 lines) TTL Low for Thru Path TTL High for Attenuation	0° C to +70° C	SMA female	+5 Vdc @ 50mA
50P-1857	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(7 lines) TTL Low for Thru Path TTL High for Attenuation	0° C to +70° C	SMA female	+5 Vdc @ 50mA
50P-1867	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(7 lines) TTL Low for Thru Path TTL High for Attenuation	0° C to +70° C	SMA female	+5 Vdc @ 50mA
50P-1891	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(7 lines) TTL Low for Thru Path TTL High for Attenuation	0° C to +70° C	SMA female	+5 Vdc @ 50mA
50P-1893	50 Ohms	1 microsecond	+20 dBm (operating) +25 dBm (no damage)	(6 lines) TTL Low for Thru Path TTL High for Attenuation	0° C to +70° C	SMA female	+5 Vdc @ 50mA

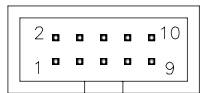
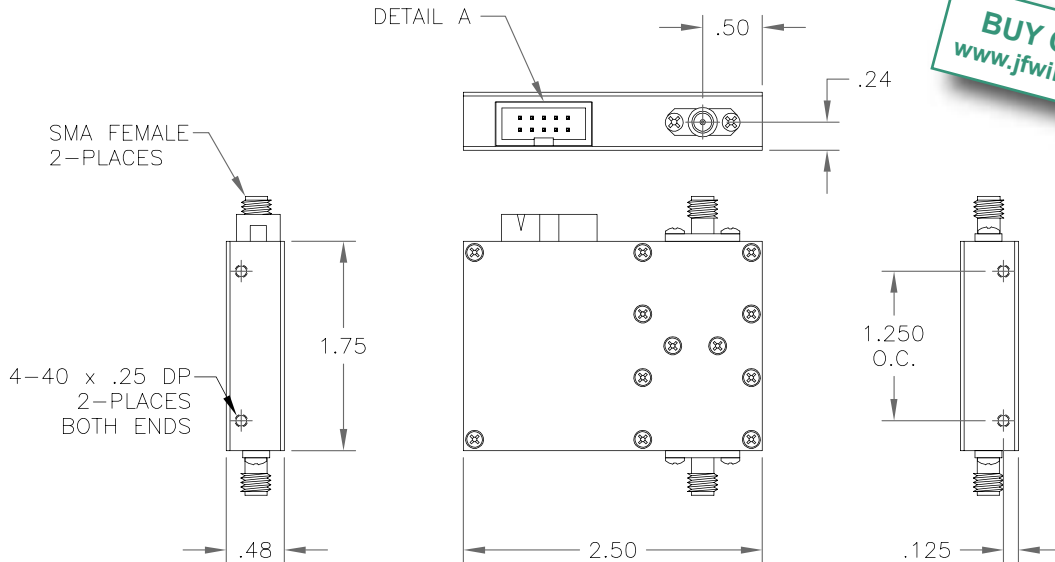
For a DC mating cable,
see page 8-12.

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PC Mount Solid State Programmable Attenuators

50P-1853 / 50P-1867 / 50P-1891 / 50P-1893

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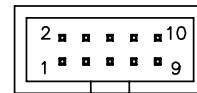
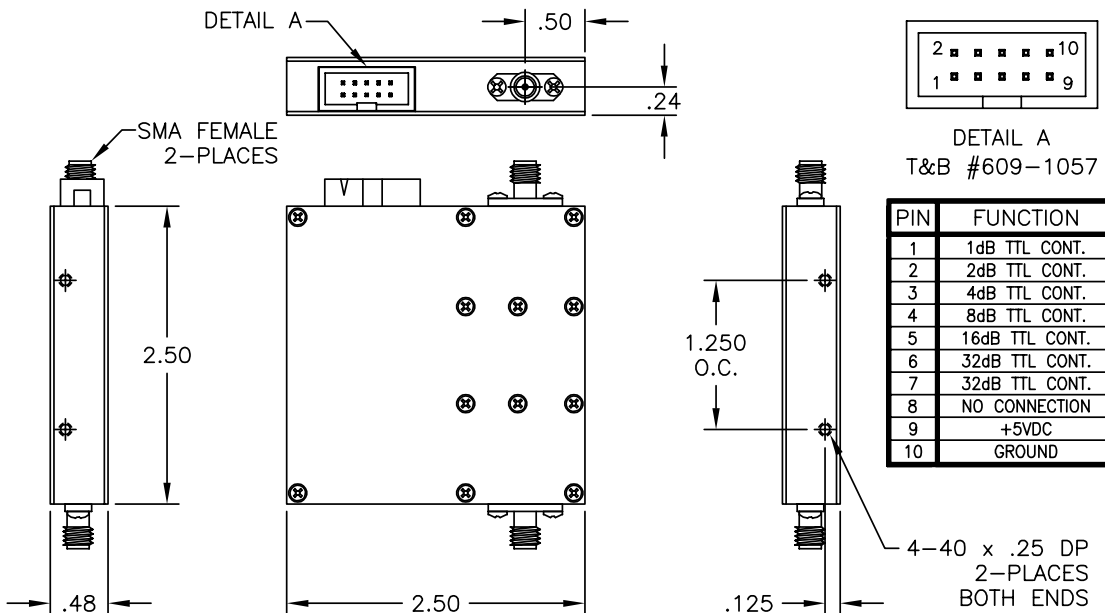
DETAIL A
T&B #609-1057

PIN	50P-1853/1893
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	32dB TTL CONT.
7	NO CONNECTION
8	NO CONNECTION
9	+5Vdc
10	GROUND

PIN	50P-1867
1	0.25dB TTL CONT.
2	0.5dB TTL CONT.
3	1dB TTL CONT.
4	2dB TTL CONT.
5	4dB TTL CONT.
6	8dB TTL CONT.
7	16dB TTL CONT.
8	NO CONNECTION
9	+5Vdc
10	GROUND

PIN	50P-1891
1	0.5dB TTL CONT.
2	1dB TTL CONT.
3	2dB TTL CONT.
4	4dB TTL CONT.
5	8dB TTL CONT.
6	16dB TTL CONT.
7	32dB TTL CONT.
8	NO CONNECTION
9	+5Vdc
10	GROUND

50P-1857



DETAIL A
T&B #609-1057

PIN	FUNCTION
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	32dB TTL CONT.
7	32dB TTL CONT.
8	NO CONNECTION
9	+5VDC
10	GROUND

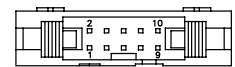
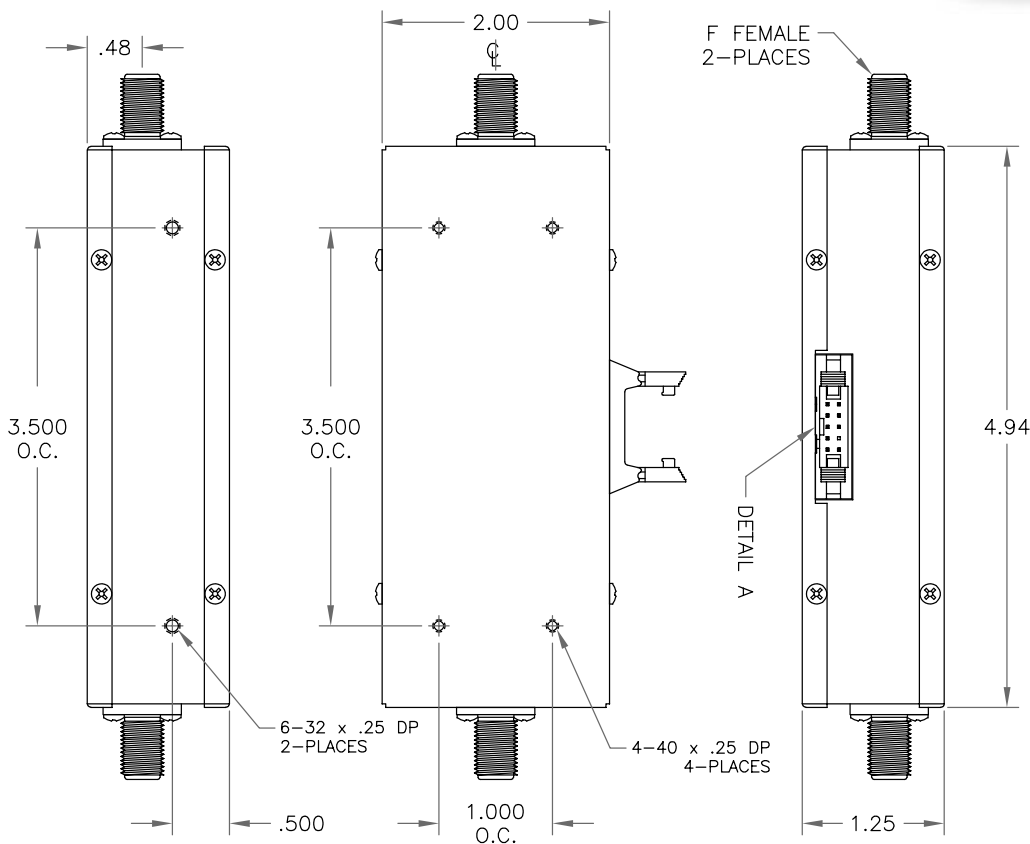
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75 Ohm Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss	RF Connectors
75P-168	50-2000 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.5 dB or 3%	1.6:1	5 dB maximum	BNC, N or F female
75P-173	450-2150 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	1, 2, 4, 8 dB +/- .3 dB 16, 32, 64 dB +/- 3%	1.5:1	2.5 dB maximum to 450 MHz 4.0 dB maximum to 2150 MHz	BNC, N or F female

Model	Impedance	Switching Speed	RF Input Power	DC Supply (nominal)	Control Logic	Operating Temperature
75P-168	75 Ohms	5 microseconds	+10 dBm average +15 dBm (1dB compression)	+5 Vdc @ 250 mA	(6 Lines) TTL low for Thru Path TTL high for attenuation	0° C to +70° C
75P-173	75 Ohms	2 microseconds	+20 dBm operating +30 dBm (no damage)	+5 Vdc @ 300 mA	(7 Lines) TTL low for Thru Path TTL high for attenuation	0° C to +70° C

For a DC mating cable, see page 8-12.



DETAIL A
3M# 3793-5303

PIN	75P-168
1	1dB TTL CONTROL
2	2dB TTL CONTROL
3	4dB TTL CONTROL
4	8dB TTL CONTROL
5	16dB TTL CONTROL
6	32dB TTL CONTROL
7	NO CONNECTION
8	NO CONNECTION
9	+5 Vdc
10	GROUND

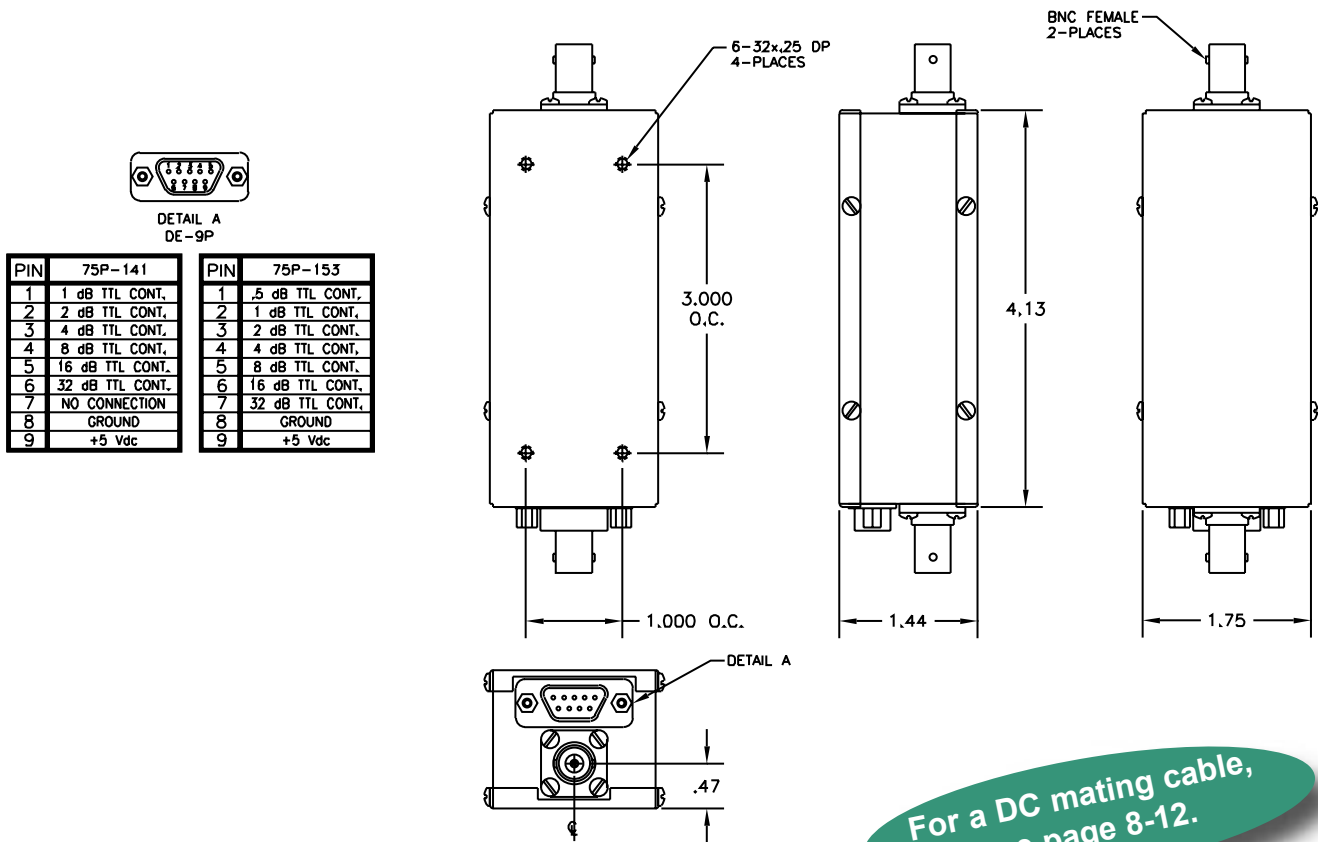
PIN	75P-173
1	1dB TTL CONTROL
2	2dB TTL CONTROL
3	4dB TTL CONTROL
4	8dB TTL CONTROL
5	16dB TTL CONTROL
6	32dB TTL CONTROL
7	64dB TTL CONTROL
8	NO CONNECTION
9	+5 Vdc
10	GROUND

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75 Ohm Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
75P-141	900-2150 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.5 dB or 3%	1.5:1	4.0 dB maximum
75P-153	20-1000 MHz	0-63.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8, 16 and 32 dB	+/- 0.3 dB or 1% 20-250 MHz +/- 0.3 dB or 2% 250-1000 MHz	1.35:1 20-250 MHz 1.5:1 250-1000 MHz	3.8 dB nominal

Model	Impedance	Switching Speed	RF Input Power	DC Supply (nominal)	Control Logic	Operating Temperature	RF Connectors
75P-141	75 Ohms	5 microseconds	+20 dBm	+5 Vdc @ 250 mA	(6 lines) TTL low for Thru Path TTL high for attenuation	0° C to +70° C	BNC, F or N female
75P-153	75 Ohms	10 microseconds	+15 dBm	+5 Vdc @ 250 mA	(7 lines) TTL low for Thru Path TTL high for attenuation	0° C to +70° C	BNC or F female

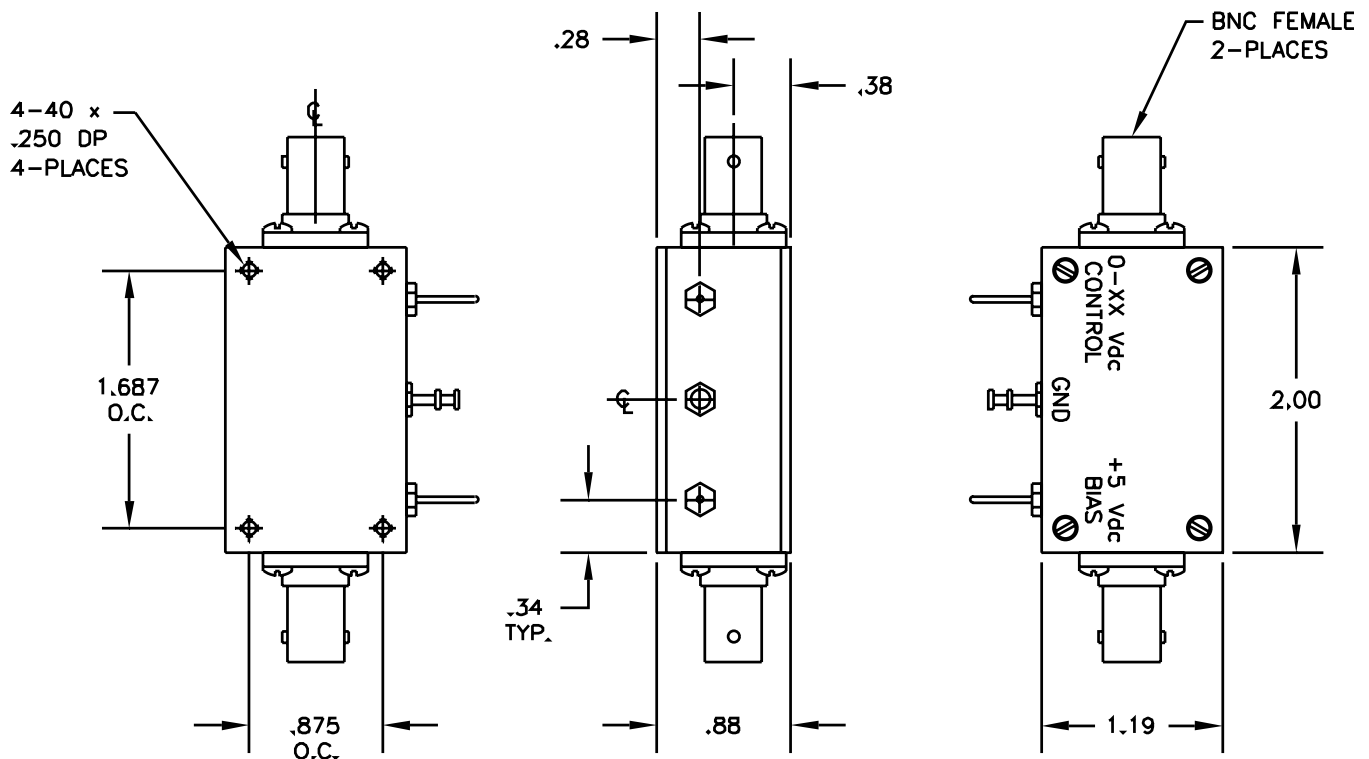


For a DC mating cable, see page 8-12.

Analog Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Accuracy	VSWR (maximum)	Insertion Loss	RF Input Power	3rd Order Intercept Point
50AP-002	10-500 MHz	0-30 dB continuously variable/ +/- 0.5 dB 0-15 dB +/- 0.75 dB 15-30 dB	1.4:1	2 dB maximum	+10 dBm	+30 dBm
50AP-077	50-2200 MHz	0-20 dB continuously variable/ +/- 1.0 dB maximum +/- 0.5 dB thru 10 dB typical	1.5:1 to 1000 MHz 1.7:1 to 2200 MHz	3 dB nominal	+10 dBm	+35 dBm
75AP-001	10-500 MHz	0-30 dB continuously variable/ +/- 0.5 dB 0-15 dB +/- 0.75 dB 15-30 dB	1.3:1	2 dB maximum	+10 dBm	+30 dBm

Model	Impedance	Switching Speed	Operating Temperature	DC Supply (nominal)	Control (negative slope)	RF Connectors
50AP-002	50 Ohms	50 microseconds	0° C to +70° C	+5 Vdc @ 2 mA	0 to +15 Vdc @ 40 mA (+15 Volts = insertion loss) (0 Volts = maximum attenuation)	BNC, SMA or N female
50AP-077	50 Ohms	50 microseconds	-20° C to +75° C	+5 Vdc @ 2 mA	0 to +10 Vdc @ 20 mA (+10 Volts = insertion loss) (0 Volts = maximum attenuation)	SMA or N female
75AP-001	75 Ohms	50 microseconds	0° C to +70° C	+5 Vdc @ 2 mA	0 to +15 Vdc @ 40 mA (+15 Volts = insertion loss) (0 Volts = maximum attenuation)	BNC, TNC or F female



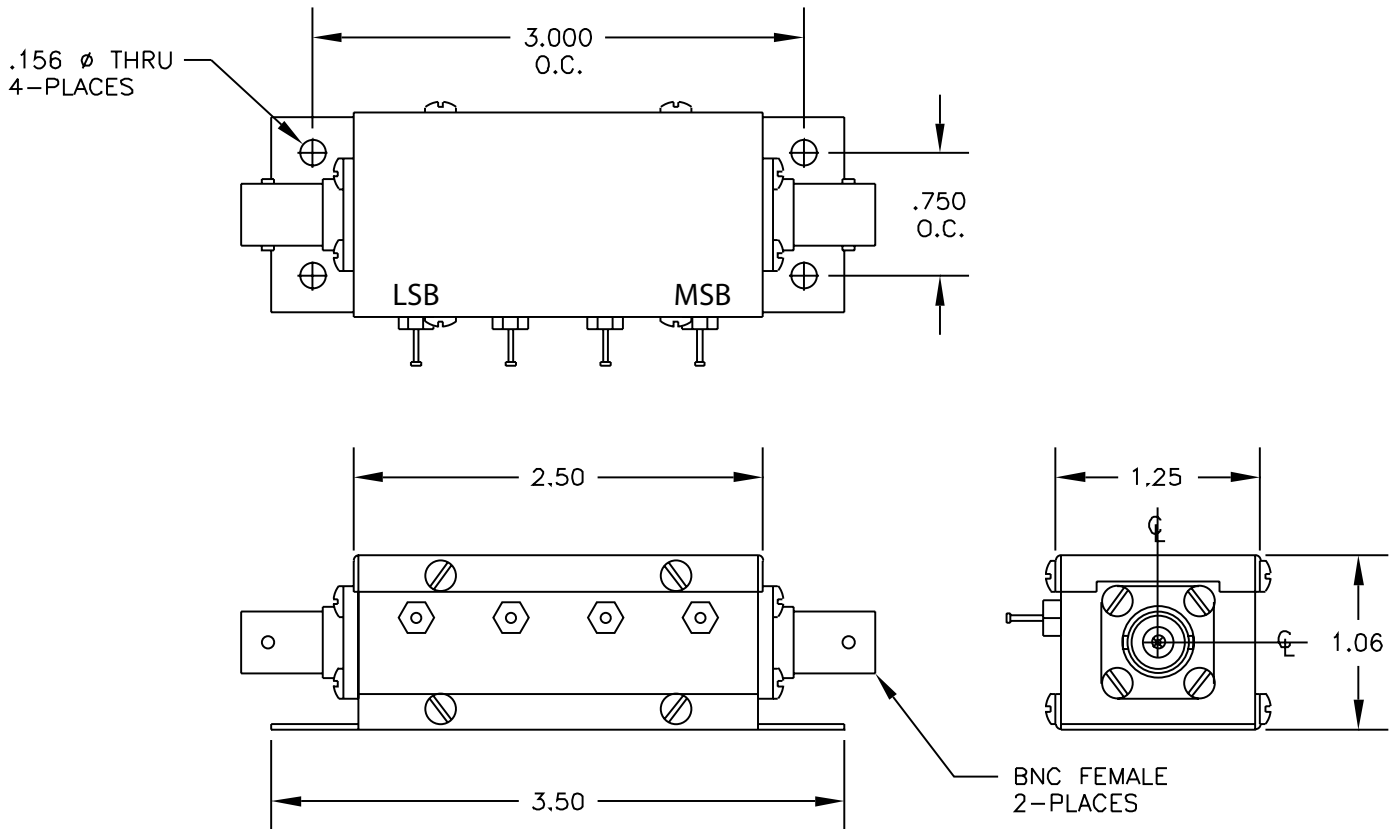
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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)	RF Input Power
50P-033	DC-1500 MHz	0-10 dB x 1 dB/ 1, 2, 3 and 4 dB	+/- 0.2 dB DC-500 MHz +/- 0.3 dB 500-1000 MHz +/- 0.4 dB 1000-1500 MHz	1.4:1 DC-1000 MHz 1.5:1 1000-1500 MHz	2 dB	2 Watts average 1000 Watts peak
50P-034	DC-1500 MHz	0-100 dB x 10 dB/ 10, 20, 30 and 40 dB	+/- 0.5 dB DC-500 MHz +/- 1.0 dB 500-1000 MHz +/- 1.5 dB 1000-1500 MHz	1.4:1 DC-1000 MHz 1.5:1 1000-1500 MHz	2 dB	1 Watt average 1000 Watts peak
50P-542	DC-2800 MHz	0-10 dB x 1 dB/ 1, 2, 3 and 4 dB	+/- 0.3 dB DC-1000 MHz +/- 0.5 dB 1000-2800 MHz	1.3:1 DC-1000 MHz 1.5:1 1000-2800 MHz	3 dB	2 Watts average 1000 Watts peak

Common Specifications

Impedance	Switching Speed	DC Supply / Control	Operating Temperature	RF Connectors
50 Ohms	6 milliseconds	+12 Vdc @ 30 mA per relay	-20° C to +85° C	BNC, SMA, N or TNC female



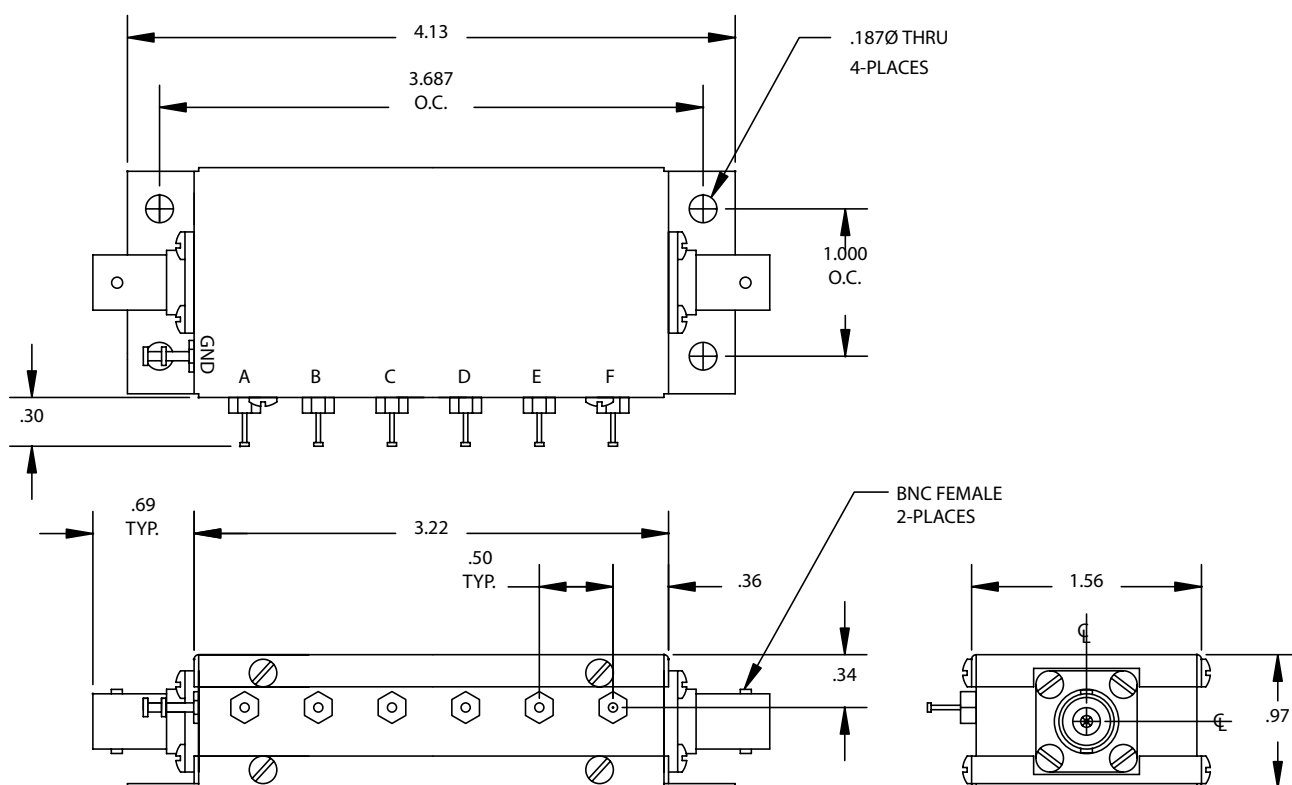
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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50P-077	DC-1000 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	1, 2, 4 and 8 dB +/- 0.2 dB 16 and 32 dB +/- 0.4 dB Accumulated Error (0-31 dB) +/- 0.5 dB Accumulated Error (32-63 dB) +/- 0.75 dB	1.4:1	2.5 dB
50P-990	DC-2500 MHz	0-31.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8 and 16 dB	+/- 0.3 dB or 2% DC-1000 MHz +/- 0.3 dB or 3% 1000-2500 MHz	1.4:1	3.6 dB

Common Specifications

Impedance	Switching Speed	RF Input Power	DC Supply / Control	Operating Temperature	RF Connectors
50 Ohms	6 milliseconds	1 Watt average 100 Watts peak	+12 Vdc @ 30 mA per relay	-20° C to +85° C	BNC, SMA, TNC or N female



MODEL	A	B	C	D	E	F
50P-077	1	2	4	8	16	32
50P-990	0.5	1	2	4	8	16

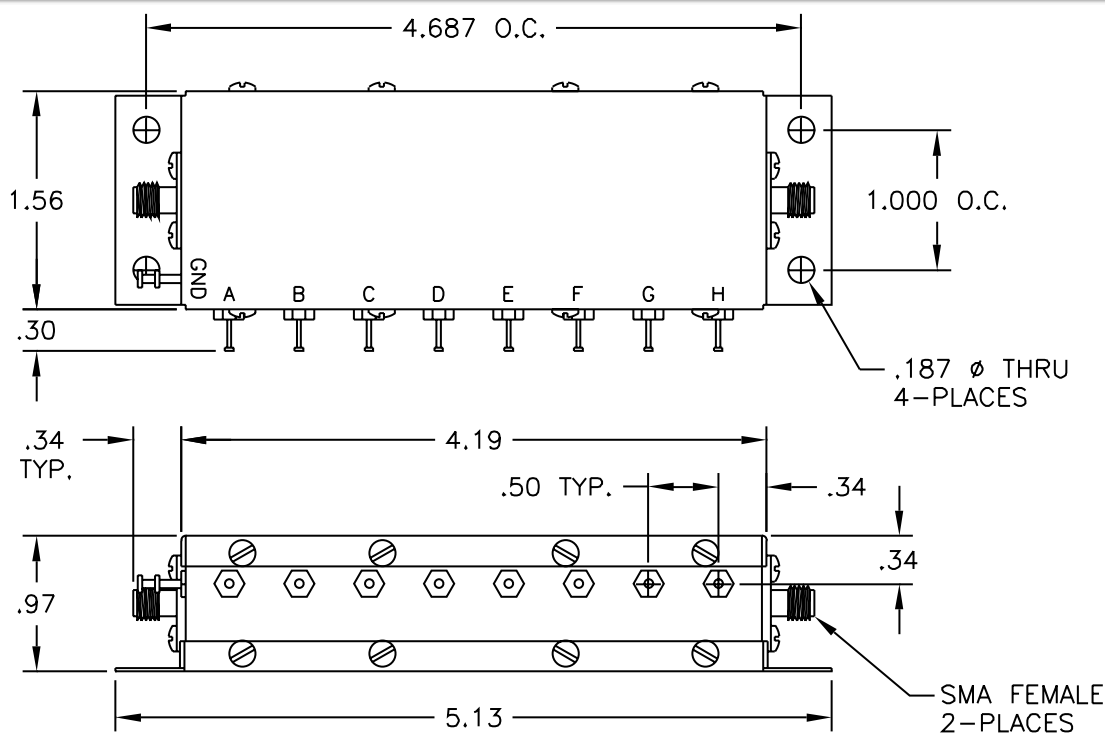
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Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)	RF Input Power
50P-076	DC-1000 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	1, 2, 4 and 8 dB +/- 0.2 dB 16, 32 and 64 dB +/- 0.4 dB Accumulated Error (0-31 dB) +/- 0.5 dB (32-127 dB) +/- 1 dB	1.4:1	3.5 dB	1 Watt average 1000 Watts peak
50P-591	DC-3000 MHz	0-85 dB x 1 dB/ 1, 2, 4, 8, 10, 20 and 40 dB	+/- 0.3 dB or 0.5% DC-500 MHz +/- 0.4 dB or 1.0% 500-1000 MHz +/- 0.5 dB or 1.0% 1000-2000 MHz +/- 0.6 dB or 1.5% 2000-3000 MHz	1.5:1 1.4:1 typical	2.5 dB DC-1000 MHz 3.5 dB 1000-2000 MHz 4.5 dB 2000-3000 MHz	1 Watt average 100 Watts peak
50P-1128	DC-2000 MHz	0-63.75 dB x 0.25 dB/ 0.25, 0.5, 1, 2, 4, 8, 16 and 32 dB	DC-1000 MHz .25, .5 dB +/- 0.10 dB 1, 2, 4, 8 dB +/- 0.25 dB 16, 32 dB +/- 2% 1000-2000 MHz 0.25, 0.5 dB +/- 0.15 dB 1, 2, 4, 8 dB +/- 0.30 dB 16, 32 dB +/- 3%	1.4:1 DC-1000 MHz 1.5:1 1000-2000 MHz	3 dB DC-1000 MHz 3.5 dB 1000-2000 MHz	0.5 Watt average

Common Specifications

Repeatability	Life (typical)	RF Connectors	Switching Speed	Impedance	DC Supply/Control	Operating Temperature
+/- 0.2 dB at any setting	10 million operations per relay	BNC, N, TNC or SMA	6 milliseconds	50 Ohms	+12 Vdc @ 30 mA per relay (8 total)	-20° C to +85° C



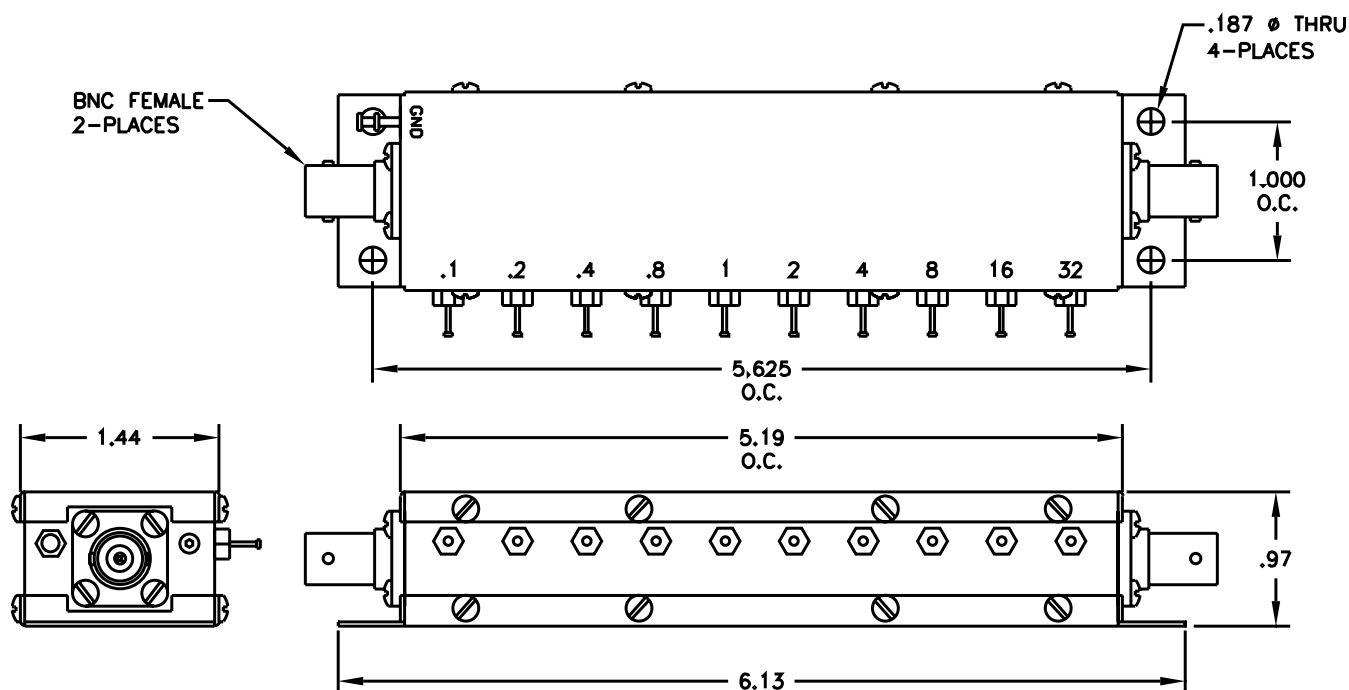
MODEL	A	B	C	D	E	F	G	H
50P-076	1	2	4	8	16	32	64	
50P-591	1	2	4	8	10	20	40	
50P-1128	.25	.5	1	2	4	8	16	32

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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1633	DC-1000 MHz	0-64.5 dB x 0.1 dB/ 0.1, 0.2, 0.4, 0.8, 1, 2, 4, 8, 16 and 32 dB	0.1, 0.2, 0.4 and 0.8 dB +/- .05 dB 1, 2 dB +/- .07 dB 4 dB +/- 0.1 dB 8 dB +/- 0.15 dB 16, 32 dB +/- 0.25 dB Accumulated Error +/- 0.25 dB or 2%	1.4:1	4 dB nominal
50P-1705	DC-200 MHz	0-64.5 dB x 0.1 dB/ 0.1, 0.2, 0.4, 0.8, 1, 2, 4, 8, 16, and 32 dB	0.1, 0.2, 0.4, 0.8 dB +/- 0.025 dB 1, 2, 4 dB +/- 0.04 dB 8, 16, 32 dB +/- 0.08 dB	1.3:1	0.75 dB maximum 0.58 dB typical @ 200 MHz

Model	Impedance	Switching Speed	RF Input Power (average)	DC Supply / Control	Operating Temperature	RF Connectors
50P-1633	50 Ohms	6 milliseconds	0.5 Watts	+12 Vdc @ 30 mA per relay (10 relays total)	-20° C to +85° C	BNC, N, TNC or SMA female
50P-1705	50 Ohms	6 milliseconds	1.0 Watt	+12 Vdc @ 15 mA per relay (10 relays total)	-20° C to +85° C	SMA, BNC, TNC or N female



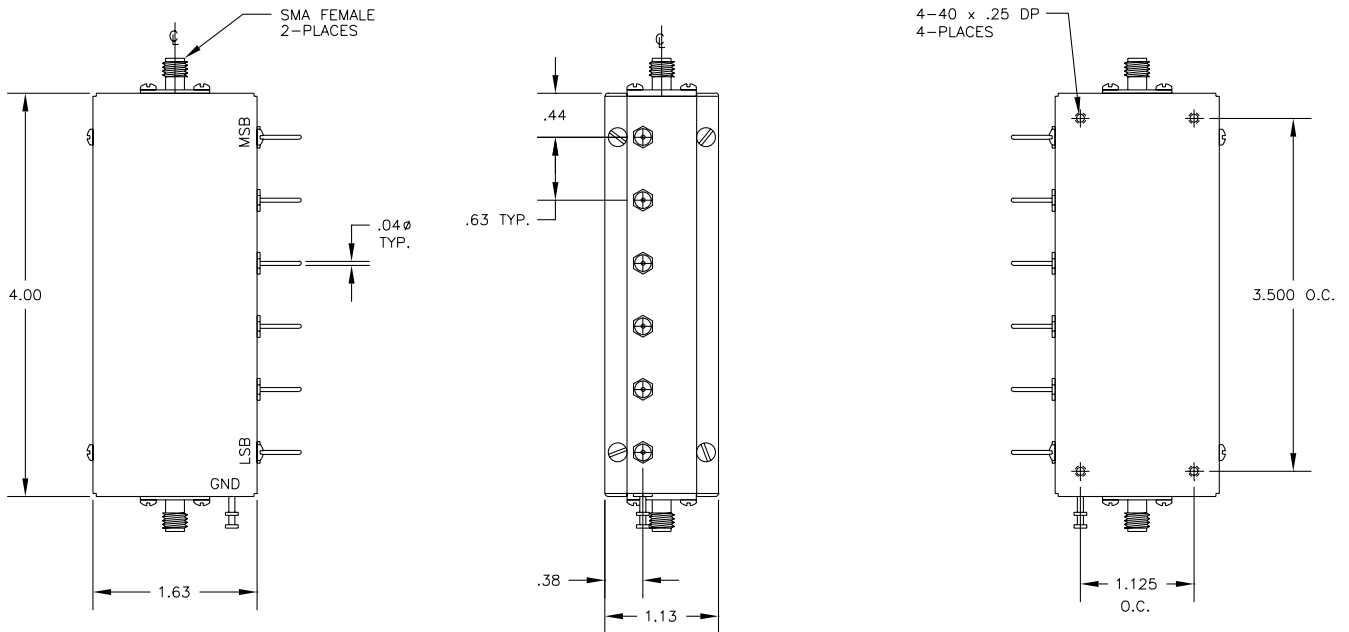
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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)	RF Input Power
50P-975	DC-1000 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.2 dB or 2%	1.25:1	0.8 dB @ 500 MHz 1.5 dB @ 1000 MHz	0.5 Watt average 100 Watts peak
50P-1126	DC-1000 MHz	0-31.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8 and 16 dB	+/- 0.2 dB or 2%	1.25:1	0.8 dB @ 500 MHz 1.5 dB @ 1000 MHz	1 Watt average 100 Watts peak
50P-1161	DC-1000 MHz	0-6.3 dB x 0.1 dB/ 0.1, 0.2, 0.4, 0.8, 1.6 and 3.2 dB	+/- .05 dB or 3%	1.30:1	1.2 dB @ 500 MHz 2.0 dB @ 1000 MHz	1 Watt average 100 Watts peak
50P-1202	DC-1600 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.3 dB or 2%	1.40:1	0.8 dB @ 500 MHz 1.5 dB @ 1000 MHz 3.0 dB @ 1600 MHz	0.5 Watt average 100 Watts peak

Common Specifications

Impedance	Switching Speed	DC Supply/Control	DC Control Connector	Operating Temperature	RF Connectors
50 Ohms	6 milliseconds	+12 Vdc @ 15 mA per relay	.04 diameter solder terminals	-20° C to + 85° C	BNC, SMA, N or TNC female



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Relay Programmable Attenuators

See outline drawing for these models on page 2-21.

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1208	DC-2500 MHz	0-15 dB x 1 dB/ 1, 2, 4 & 8 dB	1, 2, 4 and 8 dB +/- 0.2 dB or 2% DC-1000 MHz +/- 0.3 dB or 3% 1000-2500 MHz	1.5:1	0.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 2.5 dB maximum @ 2500 MHz
50P-1209	DC-2500 MHz	0-15.5 dB x 0.5 dB/ 0.5, 1, 2, 4 & 8 dB	0.5 dB +/- 0.2 dB DC-2500 MHz 1,2,4 and 8 dB +/- 0.2 dB or 2% DC-1000 MHz +/- 0.3 dB or 3% 1000-2500 MHz	1.6:1	0.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.0 dB maximum @ 2500 MHz
50P-1210	DC-2500 MHz	0-31 dB x 1 dB/ 1, 2, 4, 8 & 16 dB	1, 2, 4, 8 and 16 dB +/- 0.2 dB or 2% DC-1000 MHz +/- 0.3 dB or 3% 1000-2500 MHz	1.6:1	0.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.0 dB maximum @ 2500 MHz
50P-1211	DC-2500 MHz	0-31.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8 & 16 dB	0.5 dB +/- 0.2 dB DC-2500 MHz 1,2,4,8 and 16 dB +/- 0.2 dB or 2% DC-1000 MHz +/- 0.3 dB or 3% 1000-2500 MHz	1.6:1	0.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.5 dB maximum @ 2500 MHz
50P-1212	DC-2500 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 & 32 dB	1, 2, 4, 8, 16 and 32 dB +/- 0.2 dB or 2% DC-1000 MHz +/- 0.3 dB or 3% 1000-2500 MHz	1.6:1	3.9 dB maximum 1.0 dB typical @ 500 MHz 1.7 dB typical @ 1000 MHz 3.5 dB typical @ 2500 MHz

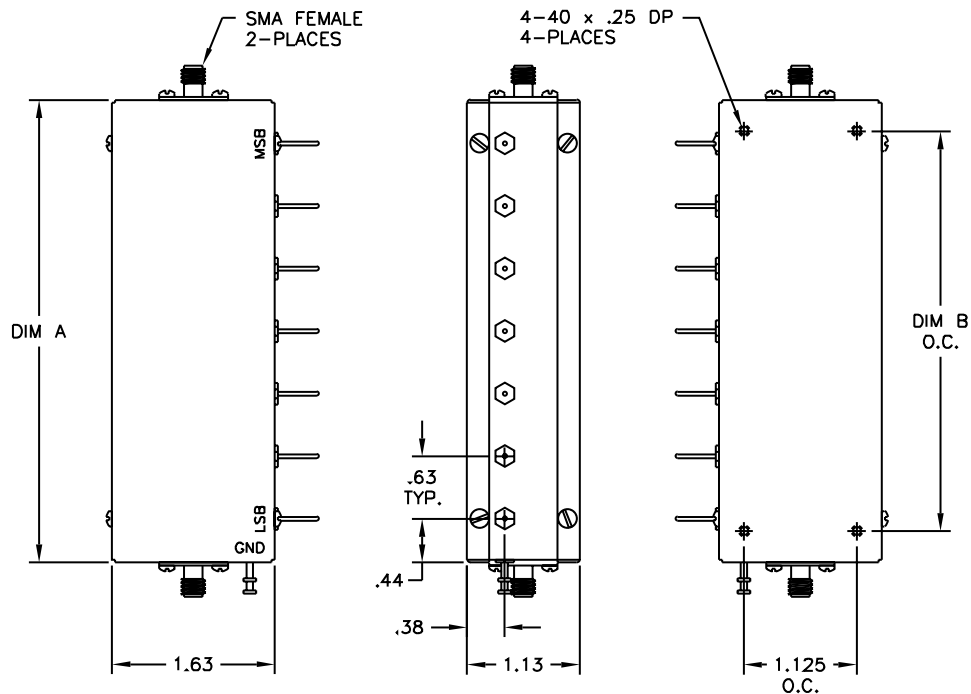
Model	Impedance	Switching Speed	Operating Temperature	RF Input Power	DC Supply/Control	RF Connectors
50P-1208	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay	BNC, SMA, N or TNC female
50P-1209	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay	BNC, SMA, N or TNC female
50P-1210	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay	BNC, SMA, N or TNC female
50P-1211	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	0.5, 1, 2, 4, 8 dB +12 Vdc @ 15 mA 16 dB +12 Vdc @ 30 mA	BNC, SMA, N or TNC female
50P-1212	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	1, 2, 4, 8 dB +12 Vdc @ 15 mA 16 dB +12 Vdc @ 30 mA 32 dB +12 Vdc @ 60 mA	BNC, SMA, N or TNC female

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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1304	DC-500 MHz	0-75 dB x 5 dB/ 5, 10, 20, 20 & 20 dB	+/- 0.5 dB or 2%	1.4:1	1.0 dB maximum
50P-1634	DC-2500 MHz	0-50 dB x 10 dB/ 10, 20 & 20 dB	+/- 0.5 dB or 2%	1.5:1	2.2 dB maximum 0.7 dB typical @ 1000 MHz 1.4 dB typical @ 2500 MHz
50P-1683	DC-2500 MHz	0-70 dB x 10 dB/ 10, 20, 20 & 20 dB	+/- 0.5 dB or 2%	1.5:1	2.5 dB maximum
50P-1758	DC-1000 MHz	0-95 dB x 1 dB/ 1, 2, 4, 8, 16, 32, & 32 dB	+/- 0.3 dB or 2%	1.5:1	2.0 dB maximum 1.4 dB typical @ 1000 MHz

Model	Impedance	Switching Speed	Operating Temperature	RF Input Power	DC Supply/ Control	RF Connectors
50P-1304	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay (5 relays total)	BNC, SMA, N or TNC female
50P-1634	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay (3 relays total)	BNC, SMA, N or TNC female
50P-1683	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay (4 relays total)	BNC, SMA, N or TNC female
50P-1758	50 Ohms	6 milliseconds	-20° C to +85° C	0.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay (7 relays total)	BNC, SMA, N or TNC female



MODEL	DIM: A	DIM: B
50P-1208	2.75	2.250
50P-1209	3.38	2.875
50P-1210	3.38	2.875
50P-1211	4.00	3.500
50P-1212	4.63	4.125
50P-1304	3.38	2.875
50P-1634	2.13	1.625
50P-1683	2.75	2.250
50P-1758	4.63	4.125

TTL Models Available
Upon Request

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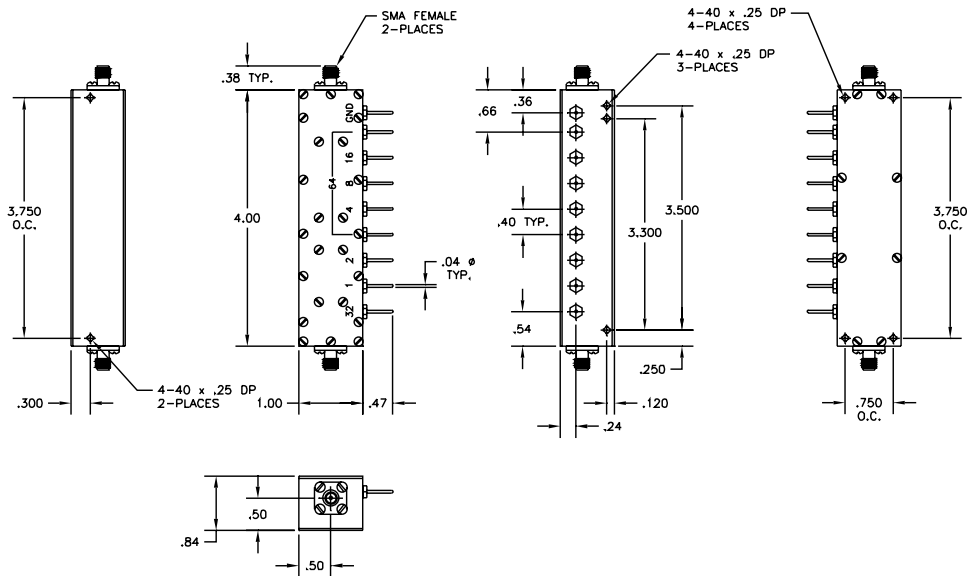
Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
50P-1436	DC-2500 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.4 dB or 2.25%	1.4:1	4.3 dB maximum 2.6 dB typical @ 1000 MHz 4.0 dB typical @ 2500 MHz
50P-1696	DC-2500 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.4 dB or 2.25%	1.4:1	3.5 dB maximum 2.9 dB typical @ 2500 MHz

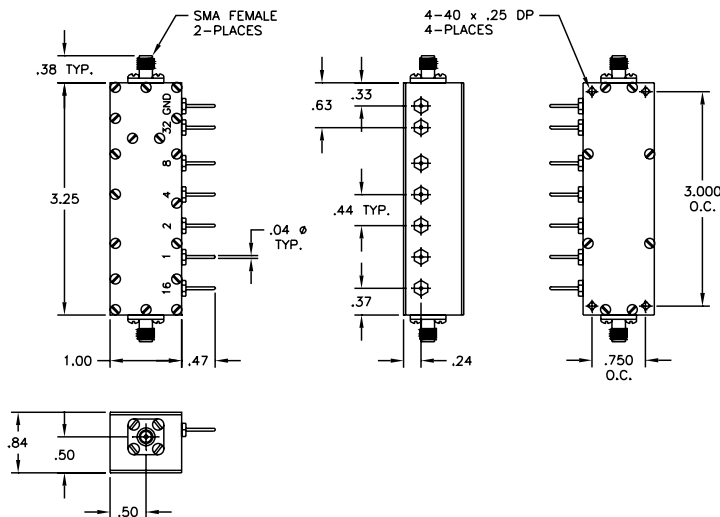
Common Specifications

Impedance	Switching Speed	RF Input Power	DC Supply / Control	Operating Temperature	RF Connectors
50 Ohms	6 milliseconds	1 Watt average	+12 Vdc @ 30 mA per relay	-20° C to +85° C	SMA female

50P-1436



50P-1696



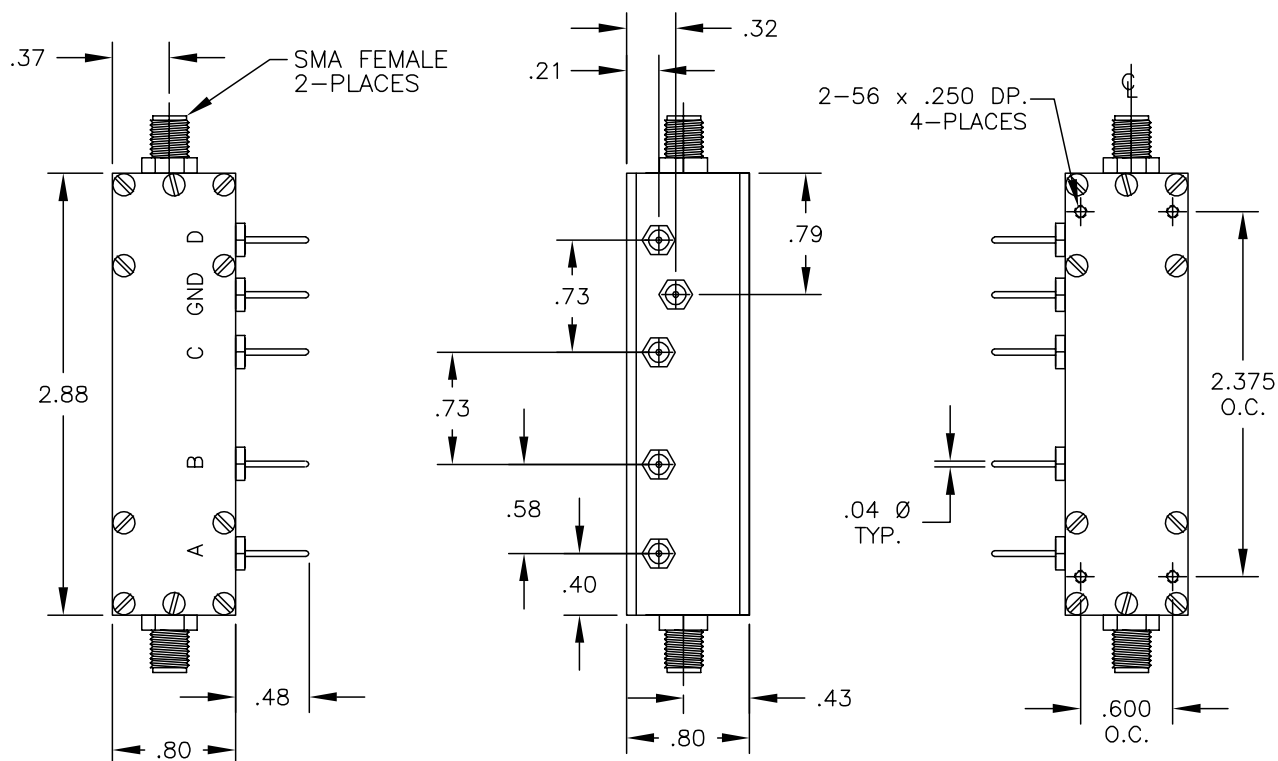
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Wideband Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
50P-766	DC-5000 MHz	0-70 dB x 10 dB/ 10, 20, 20 and 20 dB	+/- 0.3 dB or 1% DC-1000 MHz +/- 0.5 dB or 1% 1000-3000 MHz +/- 0.5 dB or 2% 3000-5000 MHz	1.3:1 DC-2000 MHz 1.5:1 2000-5000 MHz	2.5 dB DC-2000 MHz 3.5 dB 2000-5000 MHz
50P-847	DC-5000 MHz	0-15 dB x 1 dB/ 1, 2, 4 and 8 dB	+/- 0.3 dB or 3% DC-1000 MHz +/- 0.5 dB or 4% 1000-3000 MHz +/- 0.5 dB or 5% 3000-5000 MHz	1.3:1 DC-2000 MHz 1.5:1 2000-5000 MHz	2.5 dB DC-2000 MHz 4.0 dB 2000-5000 MHz
50P-1516	DC-6000 MHz	0-70 dB x 10 dB/ 10, 20, 20 and 20 dB	+/- 0.3 dB or 2% DC-2000 MHz +/- 0.5 dB or 4% 2000-6000 MHz	1.5:1	2.5 dB DC-2000 MHz 3.5 dB 2000-6000 MHz

Common Specifications

Impedance	Switching Speed	RF Input Power	DC Supply/ Control	Operating Temperature	RF Connectors
50 Ohms	10 milliseconds	0.5 Watt average 100 Watts peak	+12 Vdc @ 30 mA per relay	-20° C to +85° C	SMA female



PIN	50P-847
A	1 dB CONTROL
B	2 dB CONTROL
C	4 dB CONTROL
D	8 dB CONTROL

PIN	50P-766/1516
A	10 dB CONTROL
B	20 dB CONTROL
C	20 dB CONTROL
D	20 dB CONTROL

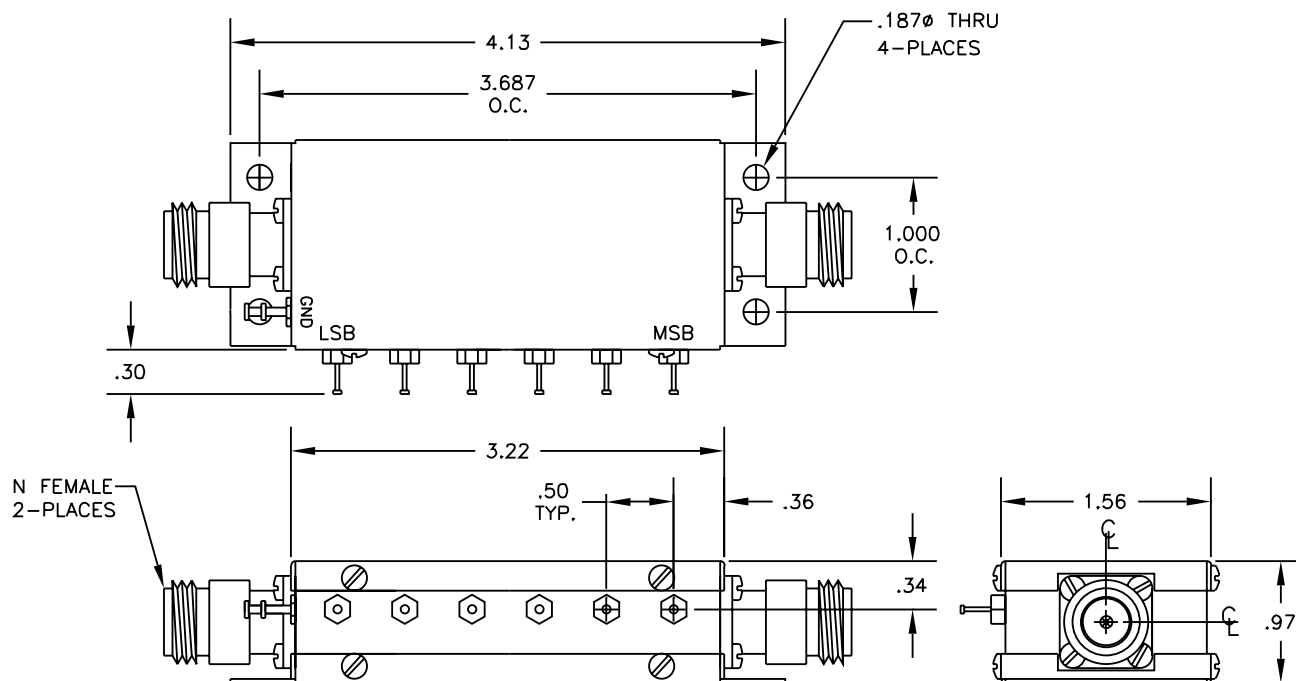
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75 Ohm Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (maximum)
75P-022	DC-1000 MHz	0-63 dB x 1 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- 0.3 dB DC-100 MHz +/- 0.3 dB or 1.0% 100-500 MHz +/- 0.3 dB or 1.5% 500-1000 MHz	1.4:1	2.2 dB
75P-093	DC-1000 MHz	0-110 dB x 10 dB/ 10, 20, 20, 20, 20 and 20 dB	+/- 0.3 dB DC-100 MHz +/- 0.3 dB or 1% 100-500 MHz +/- 0.5 dB or 1% 500-1000 MHz	1.4:1	2.2 dB

Common Specifications

Impedance	Switching Speed	RF Input Power	DC Supply / Control	Operating Temperature	RF Connectors
75 Ohms	6 milliseconds	1 Watt average 1000 Watts peak	+12 Vdc @ 30 mA per relay	-20° C to +85° C	BNC, F or N female

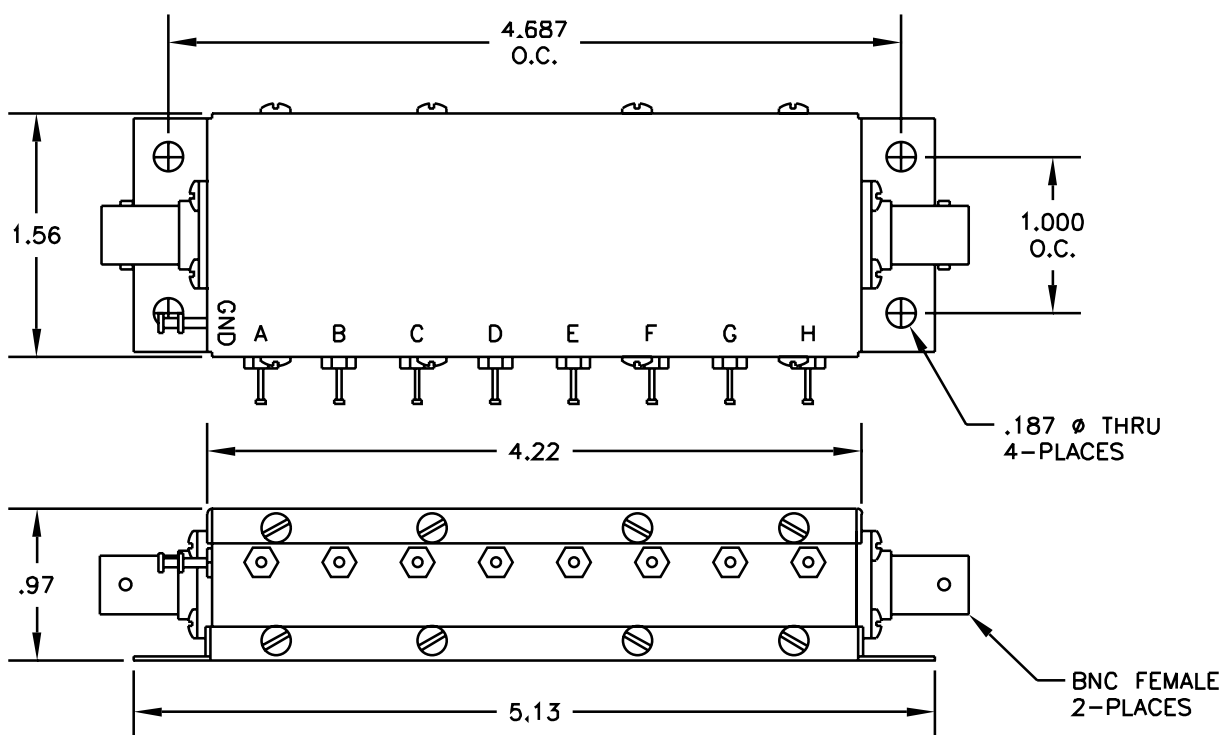


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75 Ohm Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/ Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss (nominal)
75P-033	DC-1000 MHz	0-127 dB x 1 dB/ 1, 2, 4, 8, 16, 32 and 64 dB	+/- 0.5 dB DC-100 MHz +/- 0.5 dB or 1% 100-500 MHz +/- 0.5 dB or 2% 500-1000 MHz	1.5:1	2.5 dB
75P-089	DC-500 MHz	0-63.75 dB x 0.25 dB/ 0.25, 0.5, 1, 2, 4, 8, 16 and 32 dB	+/- 0.1 dB or 1% DC-100 MHz +/- 0.2 dB or 1% 100-500 MHz	1.25:1	2.0 dB

Model	Impedance	Switching Speed	RF Input Power	DC Supply / Control	Operating Temperature	RF Connectors
75P-033	75 Ohms	6 milliseconds	1 Watt average	+12 Vdc @ 30 mA per relay	-20° C to +85° C	BNC, F or N female
75P-089	75 Ohms	6 milliseconds	1 Watt average	+12 Vdc @ 30 mA per relay	-20° C to +85° C	BNC, F or N female



75P-033

A	B	C	D	E and H	F	G
32	1	2	4	64	8	16

75P-089

A	B	C	D	E	F	G	H
.25	.5	1	2	4	8	16	32

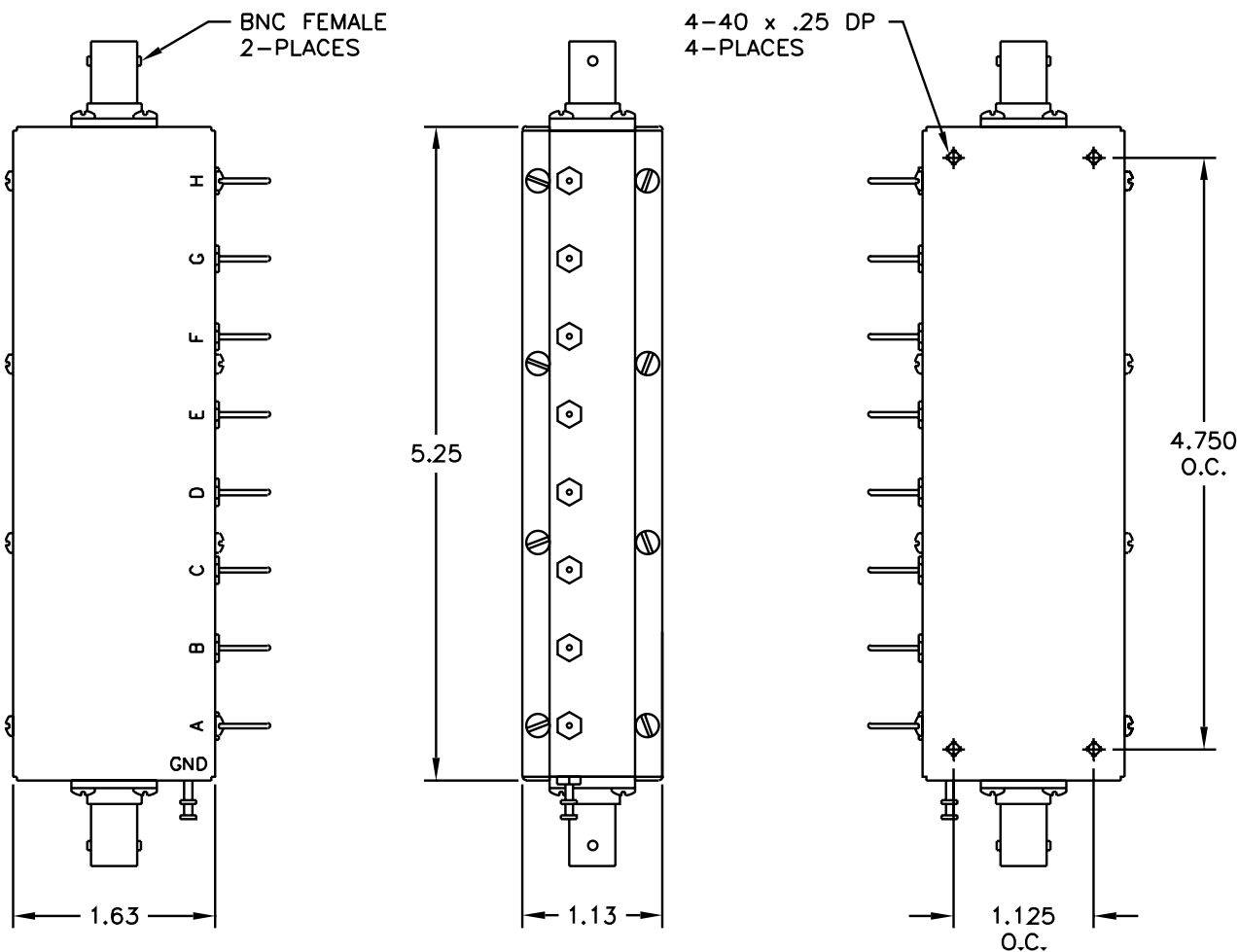
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75 Ohm Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR (maximum)	Insertion Loss
75P-157	DC-1000 MHz	0-95.5 dB x 0.5 dB/ 0.5, 1, 2, 4, 8, 16, 32 and 32 dB	+/- 0.2 dB or 2%	1.4:1	2.5 dB maximum
75P-163	DC-1000 MHz	0-63.75 dB x 0.25 dB/ 0.25, 0.5, 1, 2, 4, 8, 16, and 32 dB	0.25 dB +/- 0.05 dB 0.5, 1, and 2 dB +/- 0.1 dB 4 and 8 dB +/- 0.2 dB 16 dB +/- 0.3 dB 32 dB +/- 0.4 dB Accumulated Error +/- 0.5 dB or 1.5%	1.4:1	2.2 dB maximum 0.75 dB typical at 500 MHz 1.50 dB typical at 1000 MHz

Common Specifications

Impedance	Switching Speed	RF Input Power (average)	DC Supply/Control	Operating Temperature	RF Connectors
75 Ohms	6 milliseconds	0.5 Watts	+12 Vdc @ 15 mA per relay	-20° C to +85° C	BNC, F, N, or TNC female



MODEL	A	B	C	D	E	F	G	H
75P-157	.5	1	2	4	8	16	32	32
75P-163	.25	.5	1	2	4	8	16	32

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