

Programmable Attenuators

Solid State

Analog

Relay



Programmable Attenuators

Model Number Index

Please add connector type to the end of part number to complete model number ie; 50P-033 SMA.

Analog

	Frequency Range	Attenuation Range	Page
<u>50 Ohm</u>			
50AP-002	10-500 MHz	0-30 dB	2-16
50AP-016	50-1000 MHz	0-25 dB	2-14
50AP-076	50-2200 MHz	0-20 dB	2-14
50AP-077	50-2200 MHz	0-20 dB	2-16

75 Ohm

75AP-001	10-500 MHz	0-30 dB	2-16
75AP-012	20-1000 MHz	0-25 dB	2-14
75AP-014	40-860 MHz	0-15 dB	2-14

Solid State

	Frequency Range	Attenuation Range (dB)	Page
<u>50 Ohm</u>			
50P-686	20-1000 MHz	0-127 x 1	2-6
50P-796	20-1500 MHz	0-127 x 1	2-6
50P-827	10-600 MHz	0-63.5 x 0.5	2-11
50P-853	500-1000 MHz	0-63 x 1	2-7
50P-941	10-800 MHz	0-79 x 1	2-11
50P-1080	2-1215 MHz	0-127 x 1	2-6
50P-1122	30-1000 MHz	0-79 x 1	2-11
50P-1130	1-200 MHz	0-63.5 x 0.5	2-7
50P-1225	400-2200 MHz	0-63.5 x 0.5	2-5
50P-1226	400-2200 MHz	0-127 x 1	2-5
50P-1242	15-2000 MHz	0-127 x 1	2-8
50P-1265	800-2200 MHz	0-63 x 1	2-9
50P-1267	800-2250 MHz	0-31.5 x 0.5	2-9
50P-1300	800-2200 MHz	0-63.75 x 0.25	2-8
50P-1320	500-2500 MHz	0-127 x 1	2-5
50P-1336	800-2200 MHz	0-31 x 1	2-9
50P-1403	400-3000 MHz	0-70 x 10	2-10
50P-1501	200-3000 MHz	0-127 x 1	2-5
50P-1571	20-1000 MHz	0-63.5 x 0.5	2-7
50P-1573	30-2500 MHz	0-55 x 5	2-10
50P-1582	800-2200 MHz	0-1.5 x 0.1	2-10
50P-1605	15-3000 MHz	0-127 x 1	2-4
50P-1620	800-2500 MHz	0-63.75 x 0.25	2-8
50P-1621	20-500 MHz	0-63 x 1	2-7

75 Ohm

75P-120	50-1000 MHz	0-63 x 1	2-12
75P-141	900-2150 MHz	0-63 x 1	2-13
75P-153	20-1000 MHz	0-63.5 x 0.5	2-13

High Power Relay

	Frequency Range	Attenuation Range (dB)	Page
50P-1404	DC-2000 MHz	0-31 x 1	2-34
50P-1494	DC-2200 MHz	0-63 x 1	2-34

Relay

	Frequency Range	Attenuation Range (dB)	Page
<u>50 Ohm</u>			
50P-033	DC-1500 MHz	0-10 x 1	2-17
50P-034	DC-1500 MHz	0-100 x 10	2-17
50P-076	DC-1000 MHz	0-127 x 1	2-27
50P-077	DC-1000 MHz	0-63 x 1	2-24
50P-542	DC-2800 MHz	0-10 x 1	2-17
50P-543	DC-2800 MHz	0-90 x 10	2-17
50P-591	DC-3000 MHz	0-85 x 1	2-27
50P-766	DC-5000 MHz	0-70 x 10	2-31
50P-847	DC-5000 MHz	0-15 x 1	2-31
50P-975	DC-1000 MHz	0-63 x 1	2-25
50P-990	DC-2500 MHz	0-31.5 x 0.5	2-24
50P-1038	DC-2000 MHz	0-127 x 1	2-28
50P-1126	DC-1000 MHz	0-31.5 x 0.5	2-25
50P-1128	DC-2000 MHz	0-63.75 x 0.25	2-27
50P-1139	DC-2000 MHz	0-1.5 x 0.1	2-22
50P-1161	DC-1000 MHz	0-6.3 x 0.1	2-25
50P-1179	DC-2000 MHz	0-15 x 1	2-22
50P-1202	DC-1600 MHz	0-63 x 1	2-25
50P-1203	DC-2500 MHz	0-15 x 1	2-20
50P-1204	DC-2500 MHz	0-15.5 x 0.5	2-20
50P-1205	DC-2500 MHz	0-31 x 1	2-20
50P-1206	DC-2500 MHz	0-31.5 x 0.5	2-20
50P-1207	DC-2500 MHz	0-63 x 1	2-20
50P-1208	DC-2500 MHz	0-15 x 1	2-18
50P-1209	DC-2500 MHz	0-15.5 x 0.5	2-18
50P-1210	DC-2500 MHz	0-31 x 1	2-18
50P-1211	DC-2500 MHz	0-31.5 x 0.5	2-18
50P-1212	DC-2500 MHz	0-63 x 1	2-18
50P-1233	DC-2000 MHz	0-127 x 1	2-29
50P-1436	DC-2500 MHz	0-127 x 1	2-30
50P-1516	DC-6000 MHz	0-70 x 10	2-31
50P-1622	DC-1000 MHz	0-63.75 x 0.25	2-26
50P-1633	DC-1000 MHz	0-64.5 x 0.1	2-23

75 Ohm

75P-022	DC-1000 MHz	0-63 x 1	2-33
75P-033	DC-1000 MHz	0-127 x 1	2-32
75P-089	DC-500 MHz	0-63.75 x 0.25	2-32
75P-093	DC-1000 MHz	0-110 x 10	2-33

Programmable Attenuators

Index by Specification

Analog

Attenuation Range	Frequency Range	Model	Page
-------------------	-----------------	-------	------

50 Ohm

0-20 dB	50-2200 MHz	50AP-076	2-14
0-20 dB	50-2200 MHz	50AP-077	2-16
0-25 dB	50-1000 MHz	50AP-016	2-14
0-30 dB	10-500 MHz	50AP-002	2-16

75 Ohm

0-15 dB	40-860 MHz	75AP-014	2-14
0-25 dB	20-1000 MHz	75AP-012	2-14
0-30 dB	10-500 MHz	75AP-001	2-16

Solid State

Attenuation Range (dB)	Frequency Range	Model	Page
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50 Ohm

0-1.5 x 0.1	800-2200 MHz	50P-1582	2-10
0-31 x 1	800-2200 MHz	50P-1336	2-9
0-31.5 x 0.5	800-2250 MHz	50P-1267	2-9
0-55 x 5	30-2500 MHz	50P-1573	2-10
0-63 x 1	20-500 MHz	50P-1621	2-7
0-63 x 1	500-1000 MHz	50P-853	2-7
0-63 x 1	800-2200 MHz	50P-1265	2-9
0-63.5 x 0.5	1-200 MHz	50P-1130	2-7
0-63.5 x 0.5	10-600 MHz	50P-827	2-11
0-63.5 x 0.5	20-1000 MHz	50P-1571	2-7
0-63.5 x 0.5	400-2200 MHz	50P-1225	2-5
0-63.75 x 0.25	800-2200 MHz	50P-1300	2-8
0-63.75 x 0.25	800-2500 MHz	50P-1620	2-8
0-70 x 10	400-3000 MHz	50P-1403	2-10
0-79 x 1	10-800 MHz	50P-941	2-11
0-79 x 1	30-1000 MHz	50P-1122	2-11
0-127 x 1	2-1215 MHz	50P-1080	2-6
0-127 x 1	15-2000 MHz	50P-1242	2-8
0-127 x 1	15-3000 MHz	50P-1605	2-4
0-127 x 1	20-1000 MHz	50P-686	2-6
0-127 x 1	20-1500 MHz	50P-796	2-6
0-127 x 1	200-3000 MHz	50P-1501	2-5
0-127 x 1	400-2200 MHz	50P-1226	2-5
0-127 x 1	500-2500 MHz	50P-1320	2-5

75 Ohm

0-63 x 1	50-1000 MHz	75P-120	2-12
0-63 x 1	900-2150 MHz	75P-141	2-13
0-63.5 x 0.5	20-1000 MHz	75P-153	2-13

Relay

Attenuation Range (dB)	Frequency Range	Model	Page
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50 Ohm

0-1.5 x 0.1	DC-2000 MHz	50P-1139	2-22
0-6.3 x 0.1	DC-1000 MHz	50P-1161	2-25
0-10 x 1	DC-1500 MHz	50P-033	2-17
0-10 x 1	DC-2800 MHz	50P-542	2-17
0-15 x 1	DC-2000 MHz	50P-1179	2-22
0-15 x 1	DC-2500 MHz	50P-1203	2-20
0-15 x 1	DC-2500 MHz	50P-1208	2-18
0-15 x 1	DC-5000 MHz	50P-847	2-31
0-15.5 x 0.5	DC-2500 MHz	50P-1204	2-20
0-15.5 x 0.5	DC-2500 MHz	50P-1209	2-18
0-31 x 1	DC-2500 MHz	50P-1205	2-20
0-31 x 1	DC-2500 MHz	50P-1210	2-18
0-31.5 x 0.5	DC-1000 MHz	50P-1126	2-25
0-31.5 x 0.5	DC-2500 MHz	50P-990	2-24
0-31.5 x 0.5	DC-2500 MHz	50P-1206	2-20
0-31.5 x 0.5	DC-2500 MHz	50P-1211	2-18
0-63 x 1	DC-1000 MHz	50P-077	2-24
0-63 x 1	DC-1000 MHz	50P-975	2-25
0-63 x 1	DC-1600 MHz	50P-1202	2-25
0-63 x 1	DC-2500 MHz	50P-1207	2-20
0-63 x 1	DC-2500 MHz	50P-1212	2-18
0-63.75 x 0.25	DC-1000 MHz	50P-1622	2-26
0-63.75 x 0.25	DC-2000 MHz	50P-1128	2-27
0-64.5 x 0.1	DC-1000 MHz	50P-1633	2-23
0-70 x 10	DC-5000 MHz	50P-766	2-31
0-70 x 10	DC-6000 MHz	50P-1516	2-31
0-85 x 1	DC-3000 MHz	50P-591	2-27
0-90 x 10	DC-2800 MHz	50P-543	2-17
0-100 x 10	DC-1500 MHz	50P-034	2-17
0-127 x 1	DC-1000 MHz	50P-076	2-27
0-127 x 1	DC-2000 MHz	50P-1038	2-28
0-127 x 1	DC-2000 MHz	50P-1233	2-29
0-127 x 1	DC-2500 MHz	50P-1436	2-30

75 Ohm

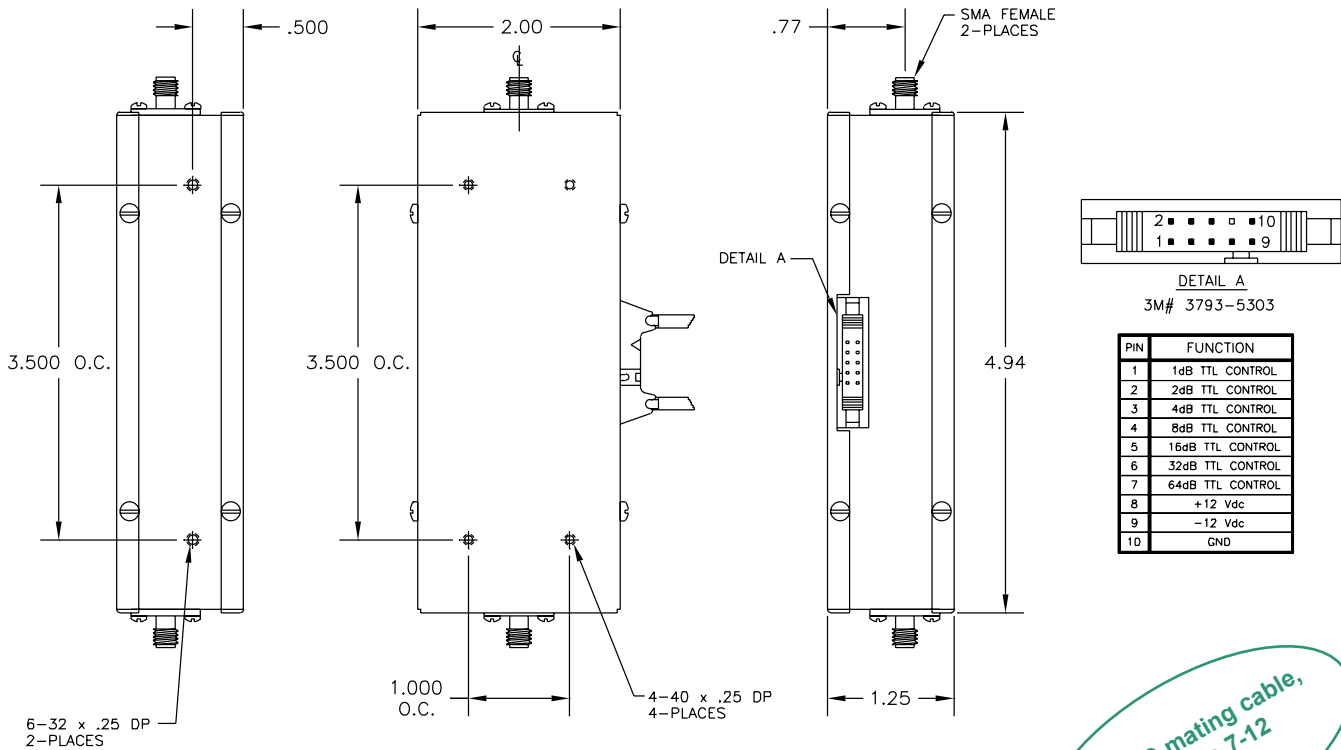
0-63 x 1	DC-1000 MHz	75P-022	2-33
0-63.75 x 0.25	DC-500 MHz	75P-089	2-32
0-110 x 10	DC-1000 MHz	75P-093	2-33
0-127 x 1	DC-1000 MHz	75P-033	2-32

Solid State Programmable Attenuators

Wideband

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connector	Impedance
50P-1605	15-3000 MHz	0-127 dB / 1,2,4,8,16,32 and 64 dB	1, 2, 4 and 8 dB +/- .3 dB 15-2000 MHz +/- .4 dB 2000-3000 MHz 16, 32 and 64 dB +/- .5 dB or 3% of programmed	1.6:1 maximum	15-2000 MHz 5 dB nominal 6 dB maximum 2000-3000 MHz 7 dB nominal 8 dB maximum	3M # 3793-5303	50 Ohms

Switching Speed	Operating Temperature	RF Input Power	Control Logic (7 lines)	DC Supply	RF Connectors
22 microseconds maximum 18 microseconds typical	0° C to +70° C	+15 dBm operating +30 dBm no damage	TTL low for "zero" setting TTL high for attenuation	+12 Vdc @ 60 mA -12 Vdc @ 60 mA	N or SMA female



For a DC mating cable, see page 7-12

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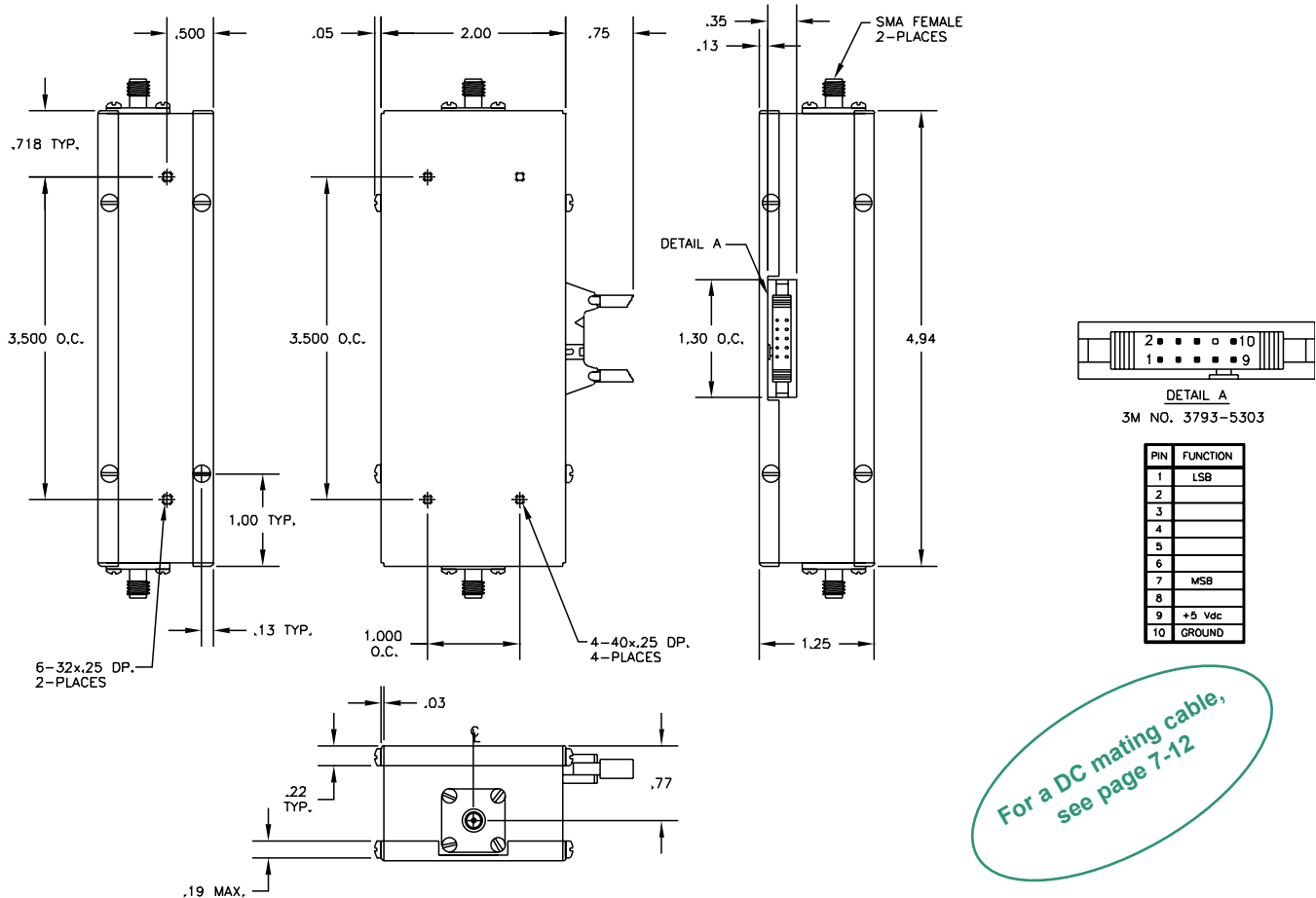
Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connector
50P-1225	400-2200 MHz	0-63.5 dB / .5,1,2,4,8,16 and 32 dB	+/- .25 dB .5,1,2,4,8 dB +/- .35 dB 16 and 32 dB accumulated error +/- .5 dB or 2% of programmed	1.5:1 maximum	2.5 dB max. to 1000 MHz 4 dB max. to 2200 MHz	3M # 3793-5303
50P-1226	400-2200 MHz	0-127 dB / 1,2,4,8,16,32 and 64 dB	+/- .25 dB 1,2,4,8 dB +/- .35 dB 16,32,64 dB accumulated error +/- .5 dB or 2% of programmed	1.5:1 maximum	2.5 dB max. to 1000 MHz 4.5 dB max. to 2200 MHz	3M # 3793-5303
50P-1320	500-2500 MHz	0-127 dB / 1,2,4,8,16,32 and 64 dB	+/- .5 dB or 2% of programmed	1.6:1 maximum	3 dB nominal @ 1000 MHz 5 dB nominal @ 2000 MHz 6 dB nominal @ 2500 MHz	3M # 3793-5303
50P-1501	200-3000 MHz	0-127 dB / 1,2,4,8,16,32 and 64 dB	+/- .25 dB 1,2,4,8 dB 200-2000 MHz +/- .4 dB 1,2,4,8 dB 2000-3000 MHz 16,32,64 dB +/- .5 dB or 2% 200-3000 MHz	1.5:1 maximum	3.5 dB max. to 1000 MHz 6.0 dB max. to 3000 MHz	3M # 3793-5303

Wideband

Common Specifications

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



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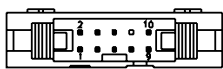
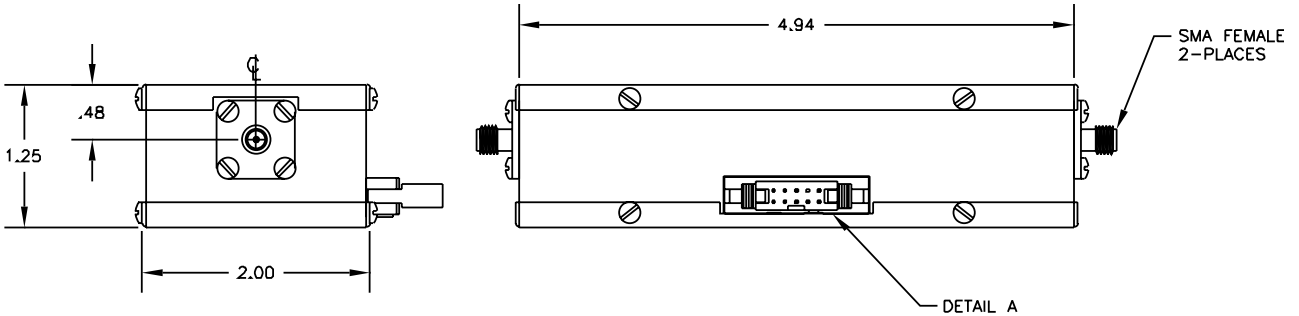
Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	Insertion Loss	Operating Temperature Range
50P-686	20-1000 MHz	0-127 dB / 1,2,4,8,16,32 and 64 dB	+/- .2 dB or 2% 20-500 MHz +/- .4 dB or 2% 500-1000 MHz	1.4:1 maximum	3 dB nominal 4 dB maximum	0° C to + 70° C
50P-796	20-1500 MHz	0-127 dB / 1,2,4,8,16,32 and 64 dB	+/- .3 dB or 1% 20-500 MHz +/- .5 dB or 2% 500-1500 MHz	1.5:1 maximum	3 dB maximum @ 500 MHz 4 dB maximum @ 1000 MHz 5 dB maximum @ 1500 MHz	-20° C to +85° C
50P-1080	2-1215 MHz	0-127 dB / 1,2,4,8,16,32 and 64 dB	+/- .2 dB or 2% 2-500 MHz +/- .4 dB or 2% 500-1215 MHz	1.4:1 maximum	3 dB nominal 4 dB maximum Flatness: +/- .75 dB maximum	0° C to +70° C

Wideband

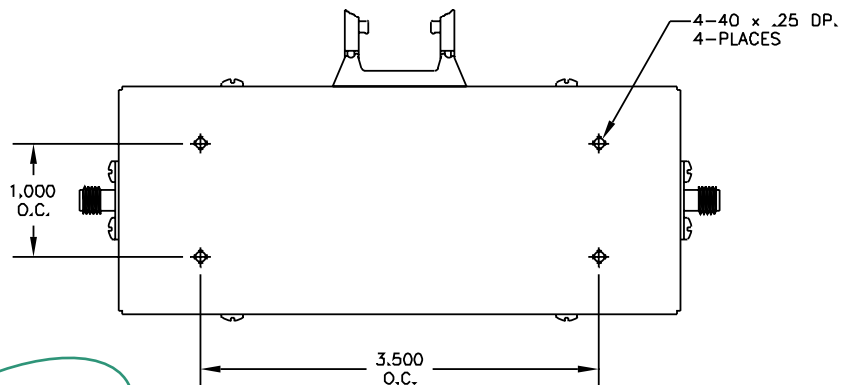
Common Specifications

Impedance	Switching Speed	RF Input Power	DC Control Connector	Control Logic (7 lines)	DC Supply	RF Connectors
50 Ohms	5 microseconds	+10 dBm	3M # 3793-5303	TTL low for "zero" setting TTL high for attenuation	+5 Vdc @ 300 mA	SMA, N, BNC, 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



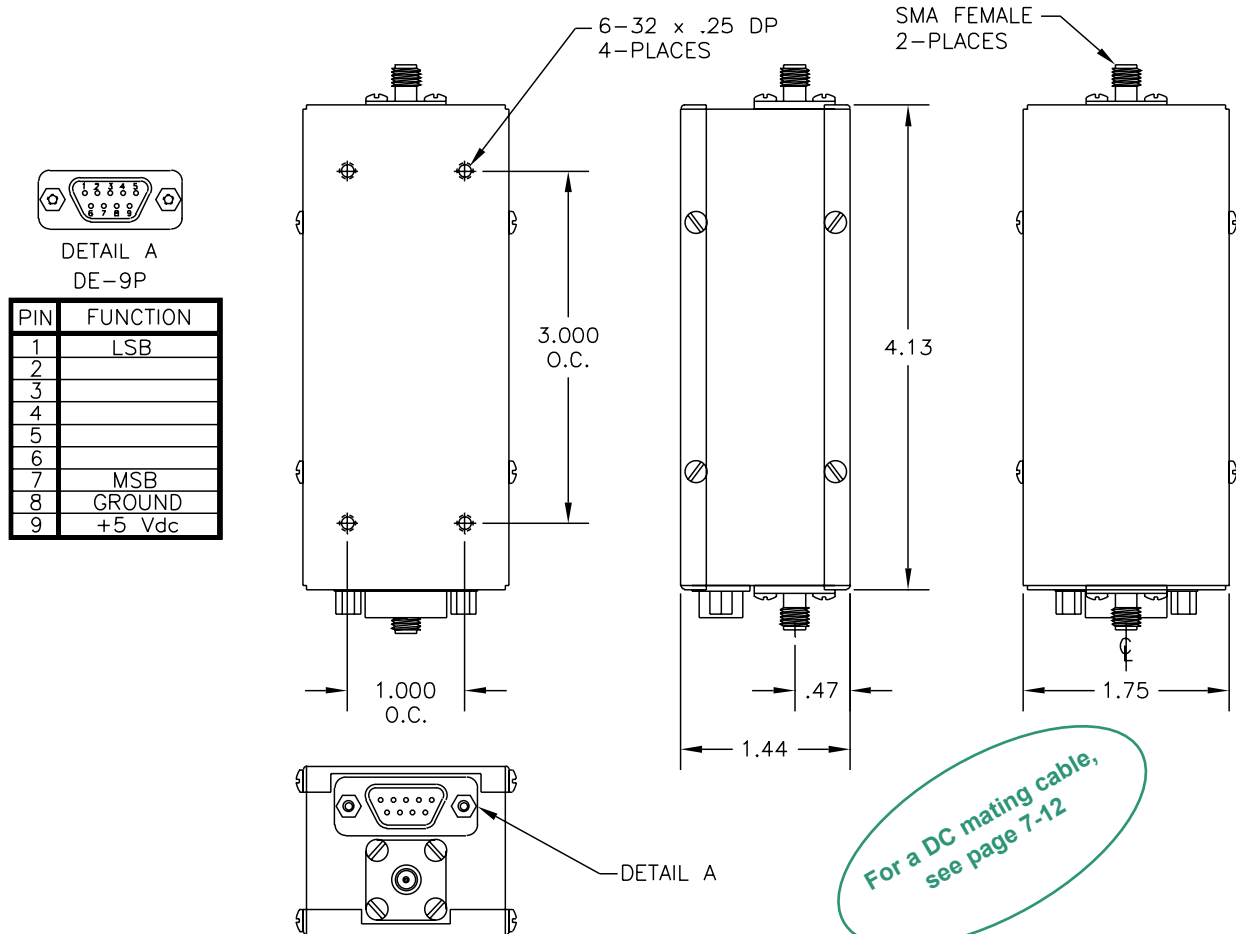
For a DC mating cable,
see page 7-12

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Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	Insertion Loss	RF Input Power	DC Control Connector
50P-1621	20-500 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	+/- .5 dB or 2%	1.5:1 maximum	3 dB nominal	+10 dBm average	DE-9P
50P-853	500-1000 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	+/- .5 dB or 1%	1.4:1 maximum	4 dB nominal	+10 dBm average	DE-9P
50P-1130	1-200 MHz	0-63.5 dB / .5,1,2,4,8,16 and 32 dB	+/- .3 dB or 1%	1.5:1 maximum	4 dB maximum	+10 dBm average	DE-9P
50P-1571	20-1000 MHz	0-63.5 dB / .5,1,2,4,8,16 and 32 dB	+/- .3 dB or 1% 20-300 MHz +/- .3 dB or 2% 300-800 MHz +/- .4 dB or 2% 800-1000 MHz	1.4:1 maximum	2.5 dB nominal 3.5 dB maximum	+10 dBm average	DE-9P

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



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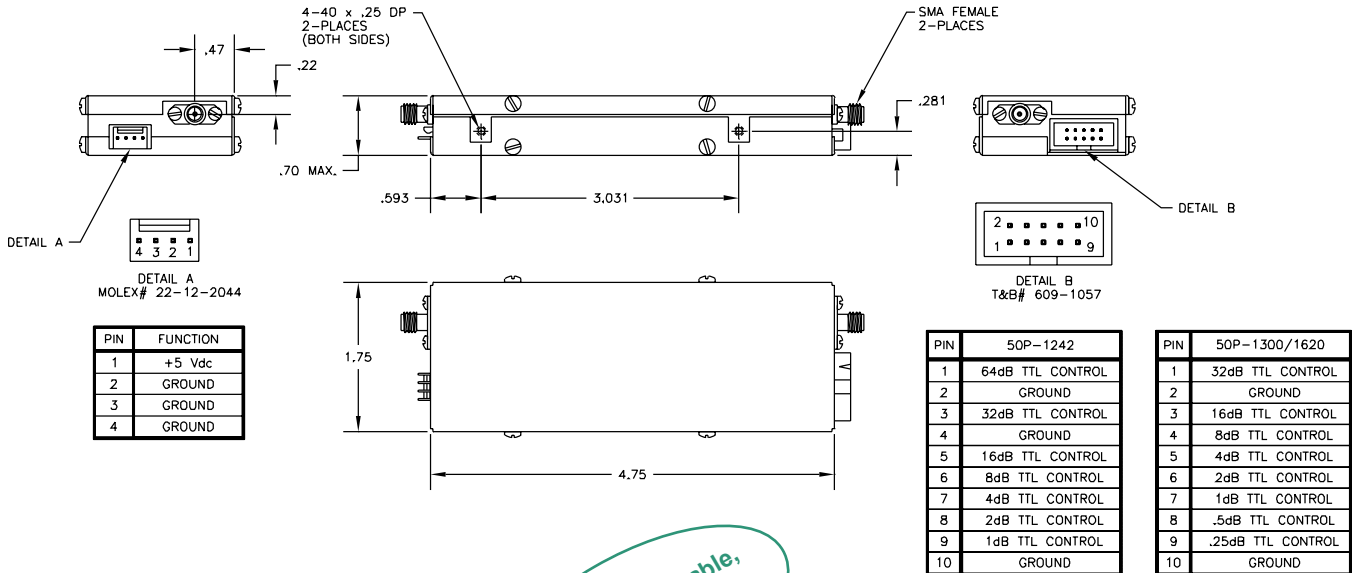
Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	Insertion Loss / Flatness	RF Input Power	DC Control Connector
50P-1242	15-2000 MHz	0-127 dB/1, 2, 4, 8, 16, 32 and 64 dB	+/- .3 dB or 2% of programmed	2 dB nominal @ 15 MHz 5.5 dB nominal @ 2000 MHz	+10 dBm operating +30 dBm no damage	T & B 609-1057
50P-1300	800-2200 MHz	0-63.75/.25, .5, 1, 2, 4, 8, 16 and 32 dB	800-1000 MHz .25 and .5 dB +/- .1 dB 1,2,4 and 8 dB +/- .25 dB 16 and 32 dB +/- .4 dB 1000-2200 MHz .25 and .5 dB +/- .15 dB 1,2,4 and 8 dB +/- .3 dB 16 and 32 dB +/- .5 dB	3 dB maximum to 1500 MHz 4 dB maximum to 2200 MHz	+20 dBm average +24 dBm (1 dB compression)	T & B 609-1057
50P-1620	800-2500 MHz	0-63.75 / .25, .5, 1, 2, 4, 8, 16 and 32 dB	.25 dB +/- .1 dB .5 dB +/- .2 dB 1,2,4 and 8 dB +/- .25 dB 16 and 32 dB +/- .4 dB	2 dB typical @ 800 MHz 3.2 dB typical @ 2500 MHz 4.0 dB maximum	+20 dBm average	T & B 609-1057

Model	Supply Connector	Impedance	Switching Speed	Operating Temp.	VSWR	DC Supply	RF Connectors
50P-1242	Molex 22-12-2044	50 Ohms	10 microseconds	0° C to +70° C	1.5:1 maximum	+5 Vdc @ 300 mA	SMA female
50P-1300	Molex 22-12-2044	50 Ohms	5 microseconds	0° C to +70° C	1.5:1 maximum	+5 Vdc @ 300 mA	SMA female
50P-1620	Molex 22-12-2044	50 Ohms	5 microseconds	0° C to +70° C	1.6:1 maximum	+5 Vdc @ 250 mA	SMA female

Control Logic

TTL low for "zero" setting
TTL high for attenuation



For a DC mating cable, see page 7-12

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Solid State Programmable Attenuators

Small Package

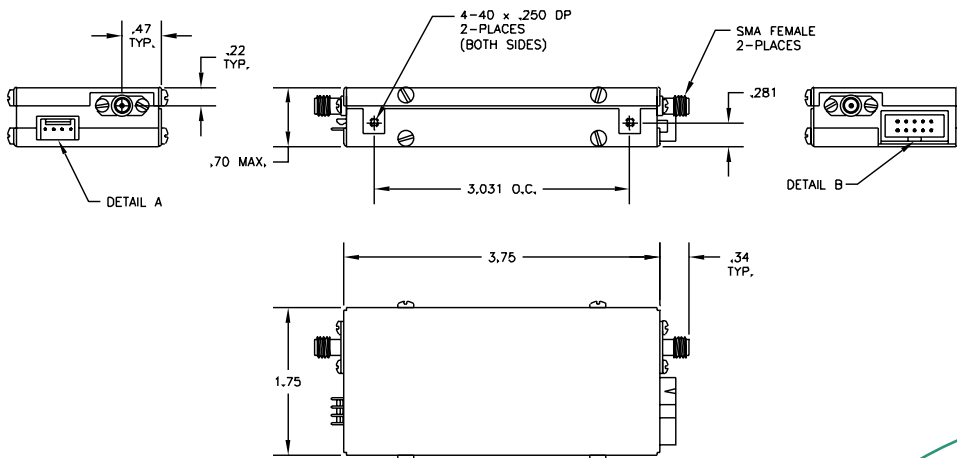
Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	Insertion Loss / Flatness	RF Input Power	DC Control Connector
50P-1265	800-2200 MHz	0-63 dB/ 1, 2, 4, 8, 16 and 32 dB	+/- .25 dB or 2% of programmed	2 dB nominal @ 800 MHz 3.5 dB nominal @ 2200 MHz	+20 dBm operating +24 dBm (1 dB compression)	T & B 609-1057
50P-1267	800-2250 MHz	0-31.5 dB/ .5, 1, 2, 4, 8 and 16 dB	+/- .3 dB or 2% of programmed	2 dB nominal @ 800 MHz 4 dB nominal @ 2250 MHz	+20 dBm operating +24 dBm (1 dB compression)	T & B 609-1057
50P-1336	800-2200 MHz	0-31 dB/ 1, 2, 4, 8 and 16 dB	+/- .25 dB or 2% of programmed	2 dB nominal @ 800 MHz 4 dB nominal @ 2200 MHz	+20 dBm operating +24 dBm (1 dB compression)	T & B 609-1057

Common Specifications

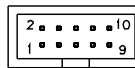
Supply Connector	Impedance	Switching Speed	Operating Temp.	VSWR	DC Supply	RF Connectors
Molex 22-12-2044	50 Ohms	5 microseconds	0° C to +70° C	1.5:1 maximum	+5 Vdc @ 250 mA	SMA female

Control Logic

TTL low for "zero" setting
TTL high for attenuation



DETAIL A
MOLEX #22-12-2044



DETAIL B
T&B #609-1057

PIN	FUNCTION
1	GROUND
2	+5 Vdc
3	NO CONNECTION
4	NO CONNECTION

PIN	50P-1265
1	GROUND
2	GROUND
3	32dB TTL CONT.
4	GROUND
5	16dB TTL CONT.
6	8dB TTL CONT.
7	4dB TTL CONT.
8	2dB TTL CONT.
9	1dB TTL CONT.
10	GROUND

PIN	50P-1267
1	GROUND
2	GROUND
3	16dB TTL CONT.
4	GROUND
5	8dB TTL CONT.
6	4dB TTL CONT.
7	2dB TTL CONT.
8	1dB TTL CONT.
9	.5dB TTL CONT.
10	GROUND

PIN	50P-1336
1	GROUND
2	GROUND
3	GROUND
4	GROUND
5	16dB TTL CONT.
6	8dB TTL CONT.
7	4dB TTL CONT.
8	2dB TTL CONT.
9	1dB TTL CONT.
10	GROUND

For a DC mating cable,
see page 7-12

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Solid State Programmable Attenuators

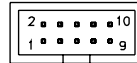
Small Package and Wideband

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	Insertion Loss	RF Input Power
50P-1403	400-3000 MHz	0-70 dB/10, 20 and 40 dB	+/- .5 dB or 2% of programmed	.75 dB nominal @ 400 MHz 2 dB nominal @ 3000 MHz	+10 dBm operating +17 dBm (1 dB compression)
50P-1573	30-2500 MHz	0-55 dB/5, 10, 20 and 20 dB	+/- .3 dB or 1% 30-500 MHz +/- .5 dB or 2% 500-2500 MHz	1.5 dB typical @ 30 MHz 4.0 dB typical @ 2500 MHz 4.5 dB maximum	+10 dBm average +30 dBm no damage
50P-1582	800-2200 MHz	0-1.5 dB/.1, .2, .4 and .8 dB	.1 dB +/- .05 dB .2 dB +/- .075 dB .4 dB +/- .1 dB .8 dB +/- .2 dB	.5 dB nominal 1 dB maximum	+20 dBm average

Model	Impedance	Switching Speed	Operating Temperature	VSWR	DC Supply	RF Connectors
50P-1403	50 Ohms	1 microsecond	0° C to +70° C	1.5:1 typical 1.6:1 maximum	+5 Vdc @ 70 mA	SMA female
50P-1573	50 Ohms	5 microseconds	0° C to +70° C	1.5:1 maximum	+5 Vdc @ 70 mA	SMA female
50P-1582	50 Ohms	5 microseconds maximum 2 microseconds typical	0° C to +70° C	1.5:1 maximum	+5 Vdc @ 15 mA	SMA female

Control Logic

TTL low for "zero" setting
TTL high for attenuation



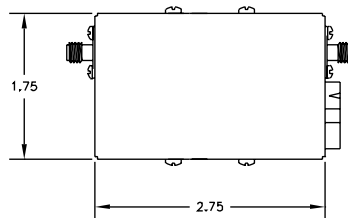
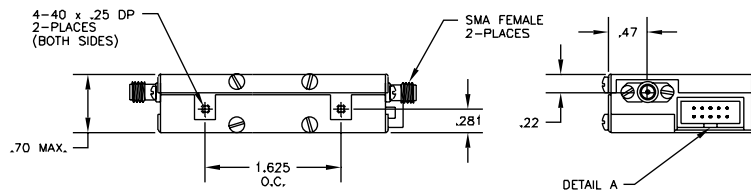
DETAIL A
T&B #609-1057

For a DC mating cable,
see page 7-12

PIN	50P-1403
1	+5 Vdc
2	GROUND
3	GROUND
4	GROUND
5	GROUND
6	GROUND
7	40dB TTL CONTROL
8	20dB TTL CONTROL
9	10dB TTL CONTROL
10	GROUND

PIN	50P-1573
1	+5 Vdc
2	GROUND
3	GROUND
4	GROUND
5	GROUND
6	20dB TTL CONTROL
7	20dB TTL CONTROL
8	10dB TTL CONTROL
9	5dB TTL CONTROL
10	GROUND

PIN	50P-1582
1	+5 Vdc
2	GROUND
3	GROUND
4	GROUND
5	GROUND
6	.8dB TTL CONTROL
7	.4dB TTL CONTROL
8	.2dB TTL CONTROL
9	.1dB TTL CONTROL
10	GROUND

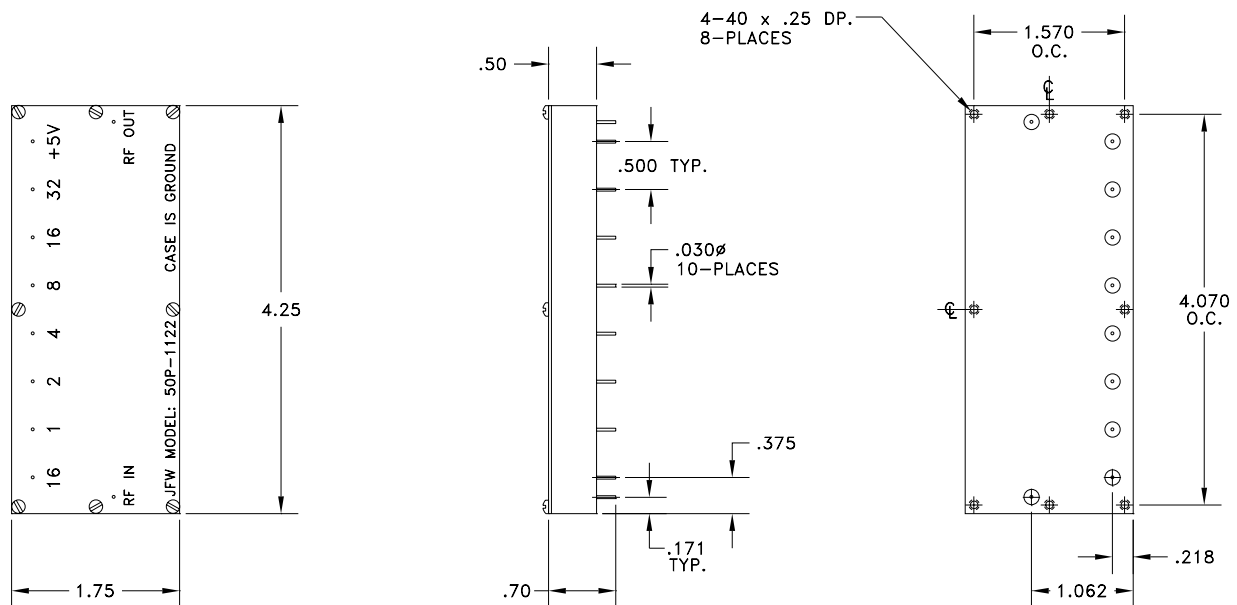


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PC Mount Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	Insertion Loss / Flatness	RF Input Power	DC Control Connector
50P-827	10-600 MHz	0-63.5 dB / .5,1,2,4,8,16 and 32 dB	+/- .25 dB or 2%	1.4:1 maximum	3.5 dB nominal / +/- .5 dB max. 10-200 MHz +/- .75 dB max. 10-600 MHz	10-100 MHz +16 dBm 100-200 MHz +19 dBm 200-600 MHz +22 dBm	Plug-in Printed Circuit
50P-941	10-800 MHz	0-79 dB / 16,1,2,4,8,16 and 32 dB	10-600 MHz +/- .25 dB or 2% 600-800 MHz +/- .25 dB or 3%	1.4:1 maximum	3.5 dB to 600 MHz 4.5 dB to 800 MHz / +/- .5 dB max. 10-200 MHz +/- .75 dB max. 10-600 MHz +/- 1.25 dB max. 10-800 MHz	10-100 MHz +16 dBm 100-200 MHz +19 dBm 200-800 MHz +22 dBm	Plug-in Printed Circuit
50P-1122	30-1000 MHz	0-79 dB / 16,1,2,4,8,16 and 32 dB	30-600 MHz +/- .35 dB or 3% 600-1000 MHz +/- .5 dB or 3%	1.5:1 maximum	3.5 dB to 600 MHz 5 dB to 1000 MHz / +/- .5 dB max. 30-600 MHz +/- 1 dB max. 600-1000 MHz	+22 dBm	Plug-in Printed Circuit

Model	Impedance	Switching Speed	Phase Shift	Control Logic (7 lines)	DC Supply	RF Connectors
50P-827	50 Ohms	4 microseconds maximum	+/- 3° @ any setting 10-400 MHz +/- 5° @ any setting 400-600 MHz	TTL low for "zero" setting TTL high for attenuation	+5 Vdc @ 350 mA	Plug-in Printed Circuit
50P-941	50 Ohms	4 microseconds maximum	+/- 3° @ any setting 10-400 MHz +/- 5° @ any setting 400-800 MHz	TTL low for "zero" setting TTL high for attenuation	+5 Vdc @ 350 mA	Plug-in Printed Circuit
50P-1122	50 Ohms	500 nanoseconds maximum	+/- 5° 30-600 MHz +/- 8° 600-1000 MHz	TTL low for "zero" setting TTL high for attenuation	+ 5 Vdc @ 350 mA	Plug-in Printed Circuit



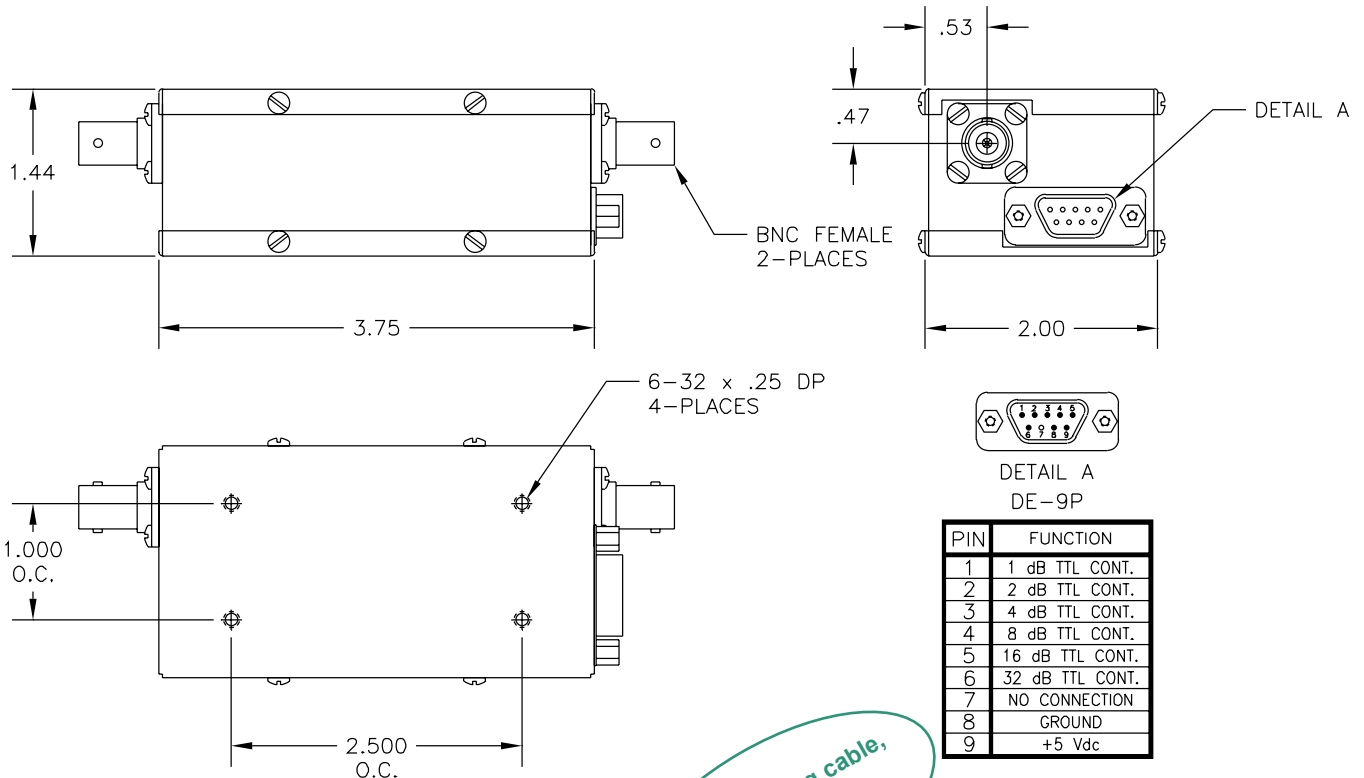
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75 Ohm Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	Insertion Loss / Flatness	RF Input Power	DC Control Connector
75P-120	50-1000 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	+/- .5 dB 50-300 MHz +/- .8 dB 300-1000 MHz	3 dB nominal / +/- .75 dB	+13 dBm	DE-9P

Model	Impedance	Switching Speed	Operating Temperature	VSWR	DC Supply	RF Connectors
75P-120	75 Ohms	20 microseconds	0° C to +70° C	1.4:1 maximum to 800 MHz 1.5:1 maximum to 1000 MHz	+5 Vdc @ 300 mA	BNC or F female

Control Logic
TTL low for "zero" setting
TTL high for attenuation



For a DC mating cable,
see page 7-12

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75 Ohm Solid State Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	Insertion Loss	RF Input Power	DC Control Connector
75P-141	900-2150 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	+/- .5 dB or 3% of programmed	4 dB maximum	+10 dBm	DE-9P
75P-153	20-1000 MHz	0-63.5 dB / .5,1,2,4,8,16 and 32 dB	+/- .3 dB or 1% 20-250 MHz +/- .3 dB or 2% 250-1000 MHz	3.8 dB nominal	+15 dBm	DE-9P

Model	Impedance	Switching Speed	Operating Temperature	VSWR	DC Supply	RF Connectors
75P-141	75 Ohms	5 microseconds	0° C to +70° C	1.5:1 maximum	+5 Vdc @ 250 mA	BNC, F or N female
75P-153	75 Ohms	10 microseconds	0° C to +70° C	1.35:1 maximum 20-250 MHz 1.5:1 maximum 250-1000 MHz	+5 Vdc @ 250 mA	BNC or F female

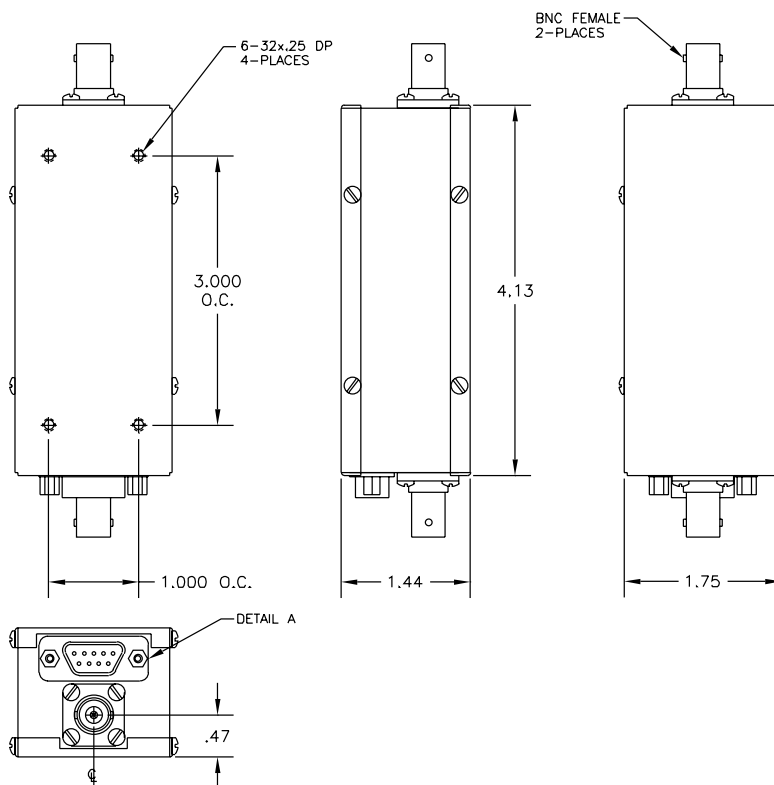
Control Logic

TTL low for "zero" setting
TTL high for attenuation



PIN	75P-141	PIN	75P-153
1	1 dB TTL CONT.	1	.5 dB TTL CONT.
2	2 dB TTL CONT.	2	1 dB TTL CONT.
3	4 dB TTL CONT.	3	2 dB TTL CONT.
4	8 dB TTL CONT.	4	4 dB TTL CONT.
5	16 dB TTL CONT.	5	8 dB TTL CONT.
6	32 dB TTL CONT.	6	16 dB TTL CONT.
7	NO CONNECTION	7	32 dB TTL CONT.
8	GROUND	8	GROUND
9	+5 Vdc	9	+5 Vdc

For a DC mating cable,
see page 7-12



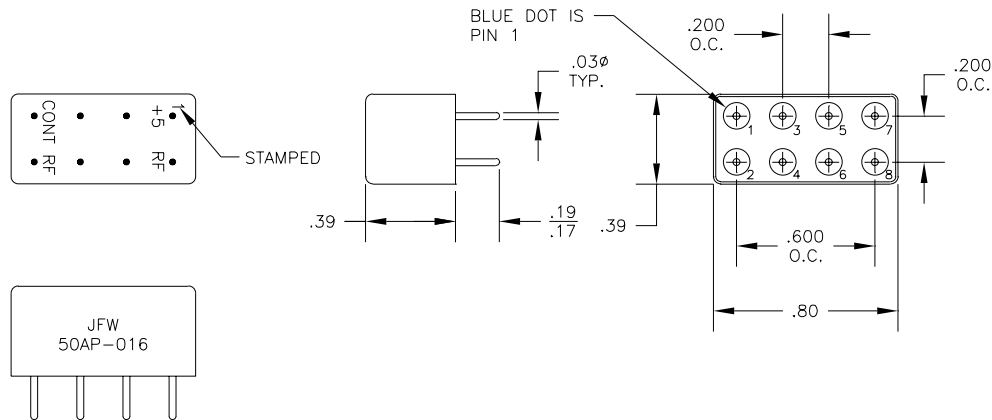
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Analog Programmable Attenuators

Wideband

Model	Frequency Range	Attenuation Range / Flatness	VSWR	Insertion Loss	RF Input Power	3rd Order Intercept Point
50AP-016	50-1000 MHz	0-25 dB continuously variable / +/- 1 dB maximum +/- .5 dB typically thru 20 dB	1.5:1 maximum	3 dB maximum	+10 dBm	+35 dBm
50AP-076	50-2200 MHz	0-20 dB continuously variable / +/- 1 dB maximum +/- .5 dB typically thru 10 dB	1.5:1 maximum to 1000 MHz 1.7:1 maximum to 2200 MHz	3 dB nominal	+10 dBm	+35 dBm
75AP-012	20-1000 MHz	0-25 dB continuously variable / +/- 1 dB 0-15 dB +/- 1.5 dB 15-25 dB	1.4:1 maximum	2 dB nominal	+10 dBm	+30 dBm
75AP-014	40-860 MHz	0-15 dB continuously variable / +/- .5 dB 0-15 dB	1.4:1 maximum	2 dB nominal	+10 dBm	+30 dBm

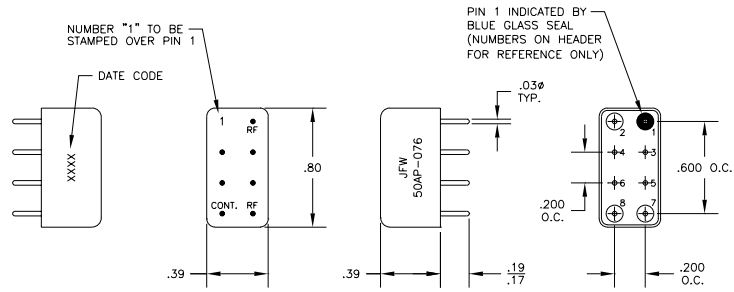
Model	Impedance	Switching Speed	Operating Temperature	DC Supply	Control (negative slope)	Connectors
50AP-016	50 Ohms	20 microseconds	-20° C to +70° C	+5 Vdc @ 2 mA	0 to +10 Volts @ 40 mA (10 Volts = insertion loss) (0 Volts = maximum attenuation)	P.C.B. Pins
50AP-076	50 Ohms	20 microseconds	-20° C to +70° C	+5 Vdc @ 2 mA	0 to +10 Volts @ 20 mA (10 Volts = insertion loss) (0 Volts = maximum attenuation)	P.C.B. Pins
75AP-012	75 Ohms	20 microseconds	-20° C to +70° C	+5 Vdc @ 2 mA	0 to +10 Volts @ 40 mA (10 Volts = insertion loss) (0 Volts = maximum attenuation)	P.C.B. Pins
75AP-014	75 Ohms	20 microseconds	-20° C to +70° C	+5 Vdc @ 2 mA	0 to +10 Volts @ 40 mA (10 Volts = insertion loss) (0 Volts = maximum attenuation)	P.C.B. Pins



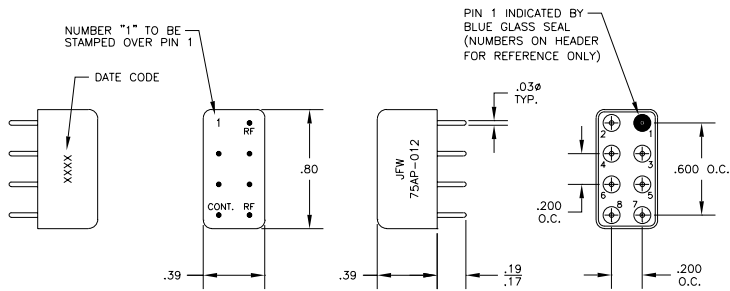
50AP-016	
PIN #	FUNCTION
1	+5Vdc BIAS
2	RF IN/OUT
3	GROUND
4	NO CONNECTION
5	GROUND
6	NO CONNECTION
7	CONTROL
8	RF IN/OUT

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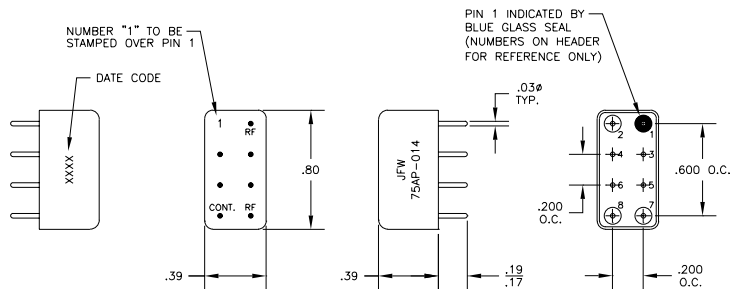
Analog Programmable Attenuators



50AP-076	
PIN #	FUNCTION
1	+5Vdc BIAS
2	RF IN/OUT
3	GROUND
4	GROUND
5	GROUND
6	GROUND
7	CONTROL
8	RF IN/OUT



75AP-012	
PIN #	FUNCTION
1	+5Vdc BIAS
2	RF IN/OUT
3	GROUND
4	NO CONNECTION
5	GROUND
6	NO CONNECTION
7	CONTROL
8	RF IN/OUT



75AP-014	
PIN #	FUNCTION
1	+5Vdc BIAS
2	RF IN/OUT
3	GROUND
4	GROUND
5	GROUND
6	GROUND
7	0-10 Vdc CONT.
8	RF IN/OUT

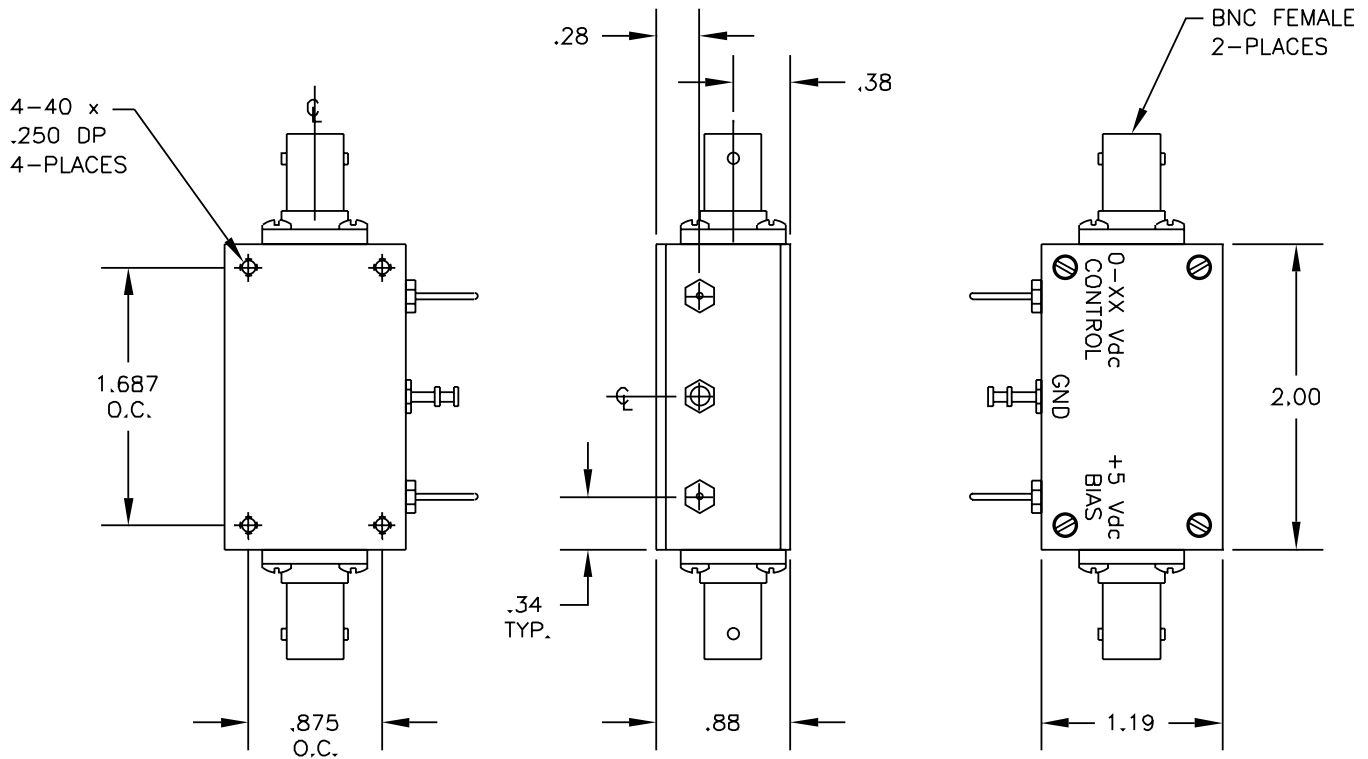
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Analog Programmable Attenuators

Wideband

Model	Frequency Range	Attenuation Range / Flatness	VSWR	Insertion Loss	RF Input Power	3rd Order Intercept Point
50AP-002	10-500 MHz	0-30 dB continuously variable / +/- .5 dB 0-15 dB +/- .75 dB 15-30 dB	1.4:1 maximum	2 dB maximum	+10 dBm	+30 dBm
50AP-077	50-2200 MHz	0-20 dB continuously variable / +/- 1 dB maximum +/- .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 / +/- .5 dB 0-15 dB +/- .75 dB 15-30 dB	1.3:1 maximum	2 dB maximum	+10 dBm	+30 dBm

Model	Impedance	Switching Speed	Operating Temperature	DC Supply	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 @ 2mA	0 to +10 Vdc @ 20 mA (10 Volts = insertion loss) (0 Volts = maximum attenuation)	SMA 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



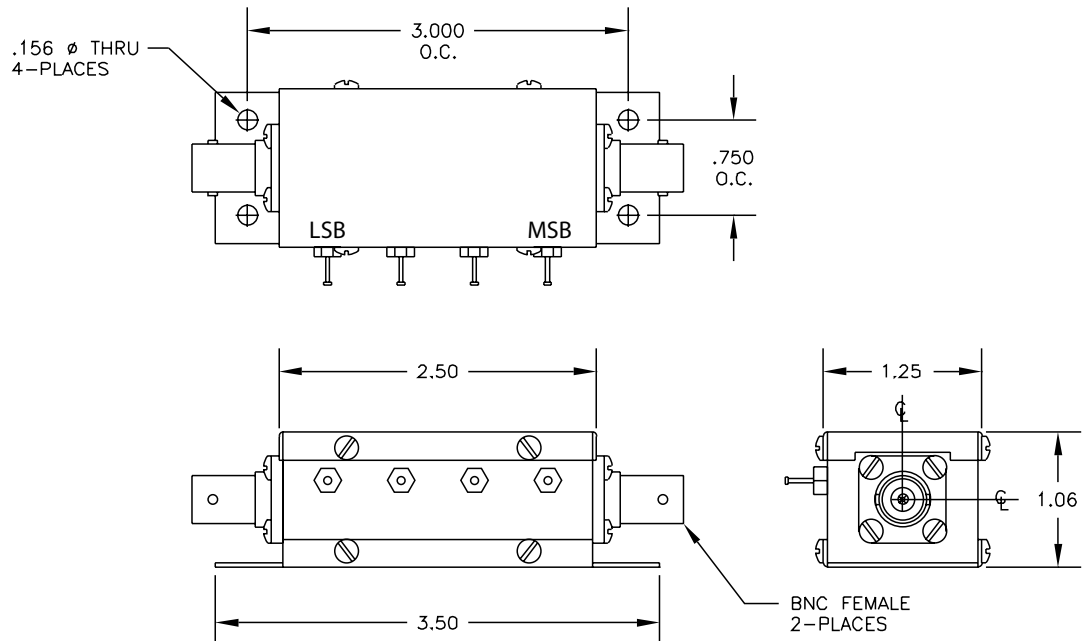
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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	Insertion Loss	RF Input Power
50P-033	DC-1500 MHz	0-10 dB / 1,2,3 and 4 dB	+/- .2 dB DC-500 MHz +/- .3 dB 500-1000 MHz +/- .4 dB 1000-1500 MHz	1.4:1 maximum DC-1000 MHz 1.5:1 maximum 1000-1500 MHz	2 dB maximum	2 Watts average 1000 Watts peak
50P-034	DC-1500 MHz	0-100 dB / 10,20,30 and 40 dB	+/- .5 dB DC-500 MHz +/- 1 dB 500-1000 MHz +/- 1.5 dB 1000-1500 MHz	1.4:1 maximum DC-1000 MHz 1.5:1 maximum 1000-1500 MHz	2 dB maximum	1 Watt average 1000 Watts peak
50P-542	DC-2800 MHz	0-10 dB / 1,2,3 and 4 dB	+/- .3 dB DC-1000 MHz +/- .5 dB 1000-2800 MHz	1.3:1 maximum DC-1000 MHz 1.5:1 maximum 1000-2800 MHz	3 dB maximum	2 Watts average 1000 Watts peak
50P-543	DC-2800 MHz	0-90 dB / 10,20,30 and 30 dB	+/- .5 dB or 2% DC-1000 MHz +/- .5 dB or 3% 1000-2800 MHz	1.4:1 maximum DC-1000 MHz 1.5:1 maximum 1000-2800 MHz	3 dB maximum	1 Watt average 1000 Watts peak

Common Specifications

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



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Relay Programmable Attenuators

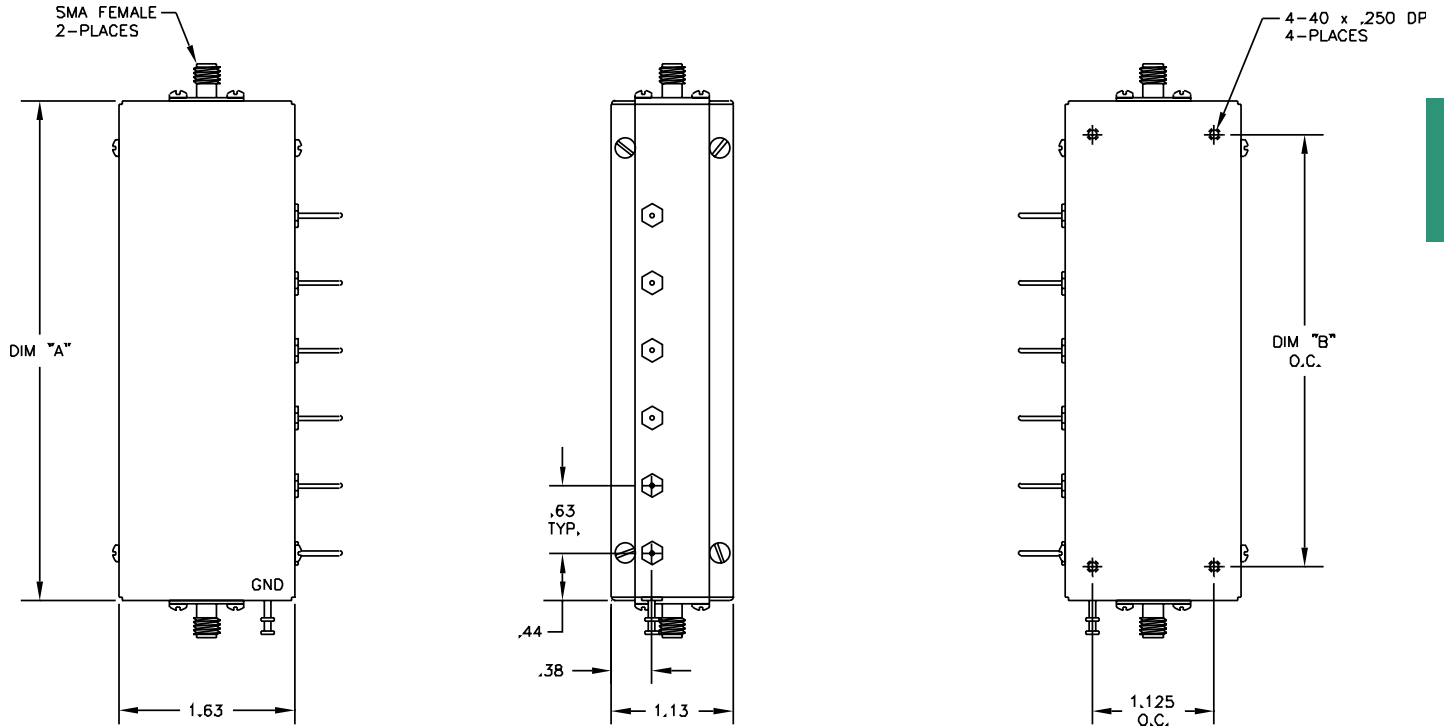
Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connectors
50P-1208	DC-2500 MHz	0-15 dB / 1,2,4 and 8 dB	DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 2.5 dB maximum @ 2500 MHz	.040 Diameter solder terminals
50P-1209	DC-2500 MHz	0-15.5 dB / .5,1,2,4 and 8 dB	.5 dB cell DC-2500 MHz +/- .2 dB 1,2,4 and 8 dB cells DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3 dB maximum @ 2500 MHz	.040 Diameter solder terminals
50P-1210	DC-2500 MHz	0-31 dB / 1,2,4,8 and 16 dB	DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3 dB maximum @ 2500 MHz	.040 Diameter solder terminals
50P-1211	DC-2500 MHz	0-31.5 dB / .5,1,2,4,8 and 16 dB	.5 dB cell DC-2500 MHz +/- .2 dB 1,2,4,8 and 16 dB cells DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.5 dB maximum @ 2500 MHz	.040 Diameter solder terminals
50P-1212	DC-2500 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	1.2 dB maximum @ 500 MHz 2.0 dB maximum @ 1000 MHz 3.5 dB maximum @ 2500 MHz	.040 Diameter solder terminals

Common Specifications

Impedance	Switching Speed	Operating Temperature	RF Input Power	DC Supply /Control	RF Connectors
50 Ohms	6 milliseconds	-20° C to +85° C	.5 Watt average 100 Watts Peak	+12 Vdc @ 15 mA per relay (Note: 32 dB cell requires 30 mA)	BNC, SMA, N or TNC female

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Relay Programmable Attenuators



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

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Relay TTL Programmable Attenuators

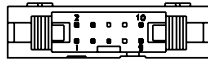
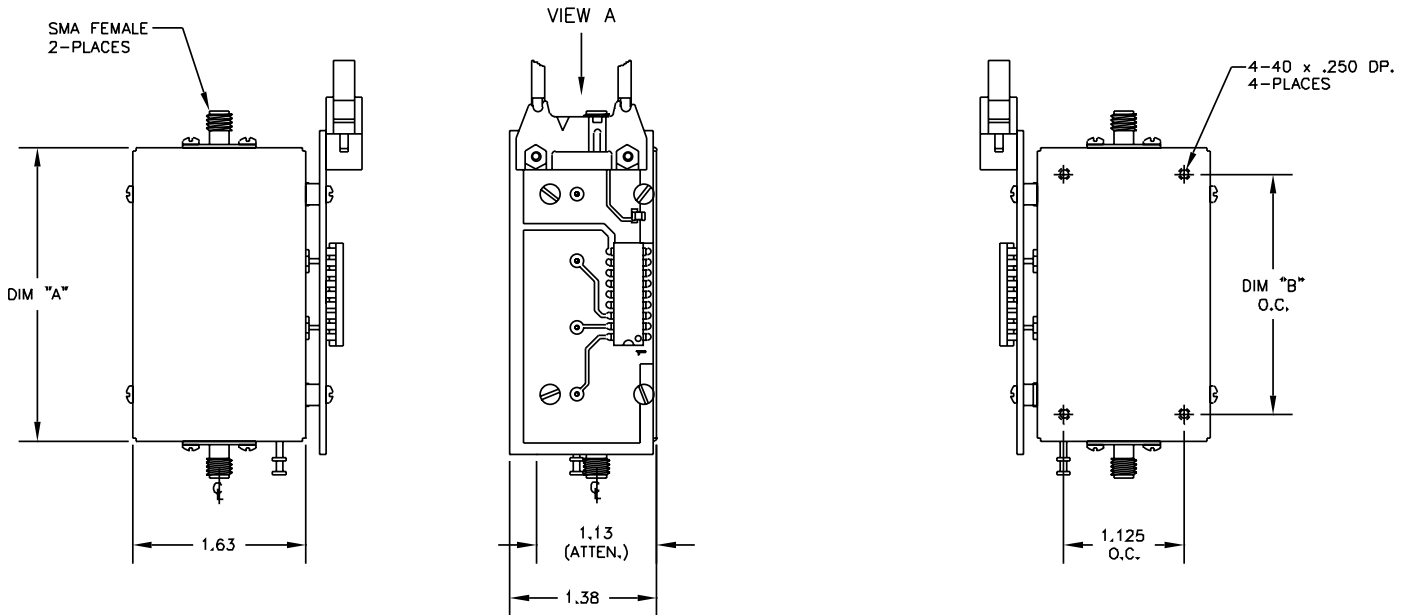
Model	Frequency Range	Attenuation Range / Step	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connectors
50P-1203	DC-2500 MHz	0-15 dB / 1,2,4 and 8 dB	DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 2.5 dB maximum @ 2500 MHz	3M 3793- 5303
50P-1204	DC-2500 MHz	0-15.5 dB / .5,1,2,4 and 8 dB	.5 dB cell DC-2500 MHz +/- .2 dB 1,2,4 and 8 dB cells DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3 dB maximum @ 2500 MHz	3M 3793- 5303
50P-1205	DC-2500 MHz	0-31 dB / 1,2,4,8 and 16 dB	DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3 dB maximum @ 2500 MHz	3M 3793- 5303
50P-1206	DC-2500 MHz	0-31.5 dB / .5,1,2,4,8 and 16 dB	.5 dB cell DC-2500 MHz +/- .2 dB 1,2,4,8 and 16 dB cells DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.5 dB maximum @ 2500 MHz	3M 3793- 5303
50P-1207	DC-2500 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	DC-1000 MHz +/- .2 dB or 2% 1000-2500 MHz +/- .3 dB or 3%	1.5:1 maximum	1.2 dB maximum @ 500 MHz 2.0 dB maximum @ 1000 MHz 3.5 dB maximum @ 2500 MHz	3M 3793- 5303

Common Specifications

Impedance	Switching Speed	Operating Temperature	RF Input Power	Control Logic	DC Supply	RF Connectors
50 Ohms	6 milliseconds	-20° C to +85° C	.5 Watt average 100 Watts Peak	TTL low for "zero" setting TTL high for attenuation	+12 Vdc @ 15 mA per relay (Note: 32 dB cell requires 30 mA)	BNC, SMA, N or TNC (female)

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Relay TTL Programmable Attenuators



VIEW A
3M# 3793-5303

For a DC mating cable,
see page 7-12

PIN	50P-1203
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	
6	
7	
8	
9	GND
10	+12Vdc

PIN	50P-1204
1	.5dB TTL CONT.
2	1dB TTL CONT.
3	2dB TTL CONT.
4	4dB TTL CONT.
5	8dB TTL CONT.
6	
7	
8	
9	GND
10	+12Vdc

PIN	50P-1205
1	1dB TTL CONT.
2	2dB TTL CONT.
3	4dB TTL CONT.
4	8dB TTL CONT.
5	16dB TTL CONT.
6	
7	
8	
9	GND
10	+12Vdc

PIN	50P-1206
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	
8	
9	GND
10	+12Vdc

PIN	50P-1207
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	
8	
9	GND
10	+12Vdc

MODEL	DIM "A"	DIM "B"
50P-1203	2.75	2.250
50P-1204	3.38	2.875
50P-1205	3.38	2.875
50P-1206	4.00	3.500
50P-1207	4.63	4.125

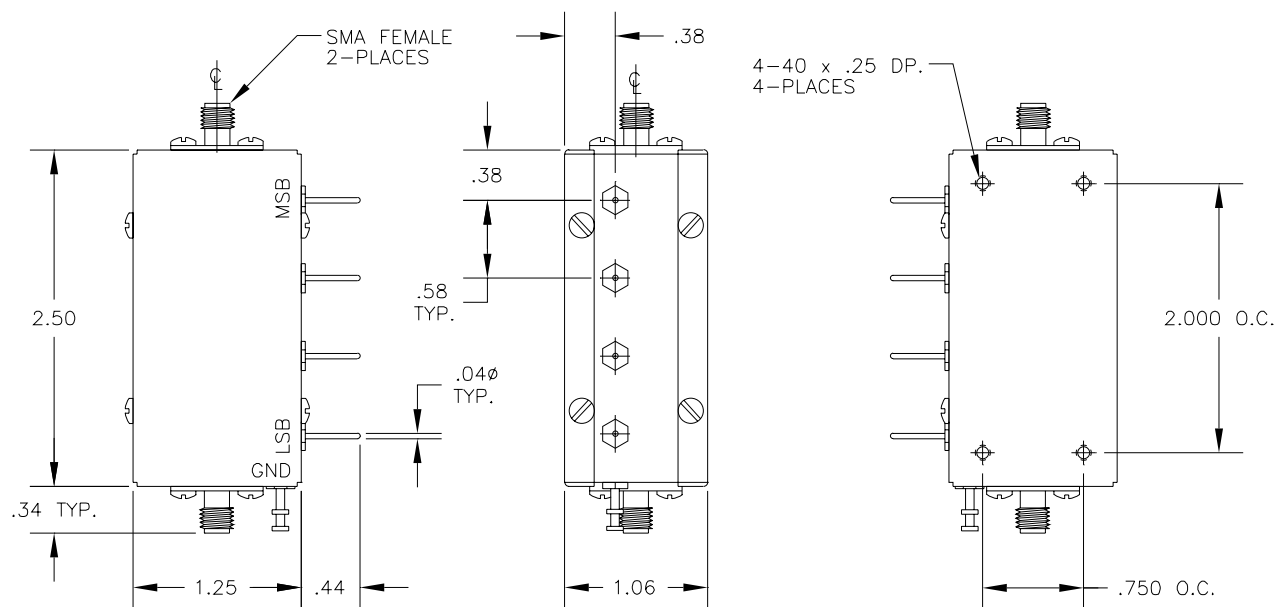
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Relay Programmable Attenuators

Model	Frequency	Attenuation Range / Steps	Attenuation Accuracy (per cell)	Attenuation Accuracy (max Attenuation)	VSWR	Insertion Loss
50P-1139	DC-2000 MHz	0-1.5 dB / .1, .2, .4 and .8 dB	+/- .02 dB DC-500 MHz +/- .03 dB 500-1000 MHz +/- .05 dB 1000-2000 MHz	+/- .1 dB	1.4:1 maximum	3.5 dB @ 2000 MHz
50P-1179	DC-2000 MHz	0-15 dB / 1, 2, 4 and 8 dB	n/a	+/- .3 dB DC-1000 MHz +/- .5 dB 1000-2000 MHz	1.4:1 maximum	2 dB @ 2000 MHz

Common Specifications

Impedance	Switching Speed	Operating Temperature	RF Input Power	DC Control Connector	DC Supply / Control	RF Connectors
50 Ohms	6 milliseconds	-20° C to +85° C	1 Watt average 100 Watts peak	.040 Diameter solder terminals	+12 Vdc @ 30 mA per relay	SMA female

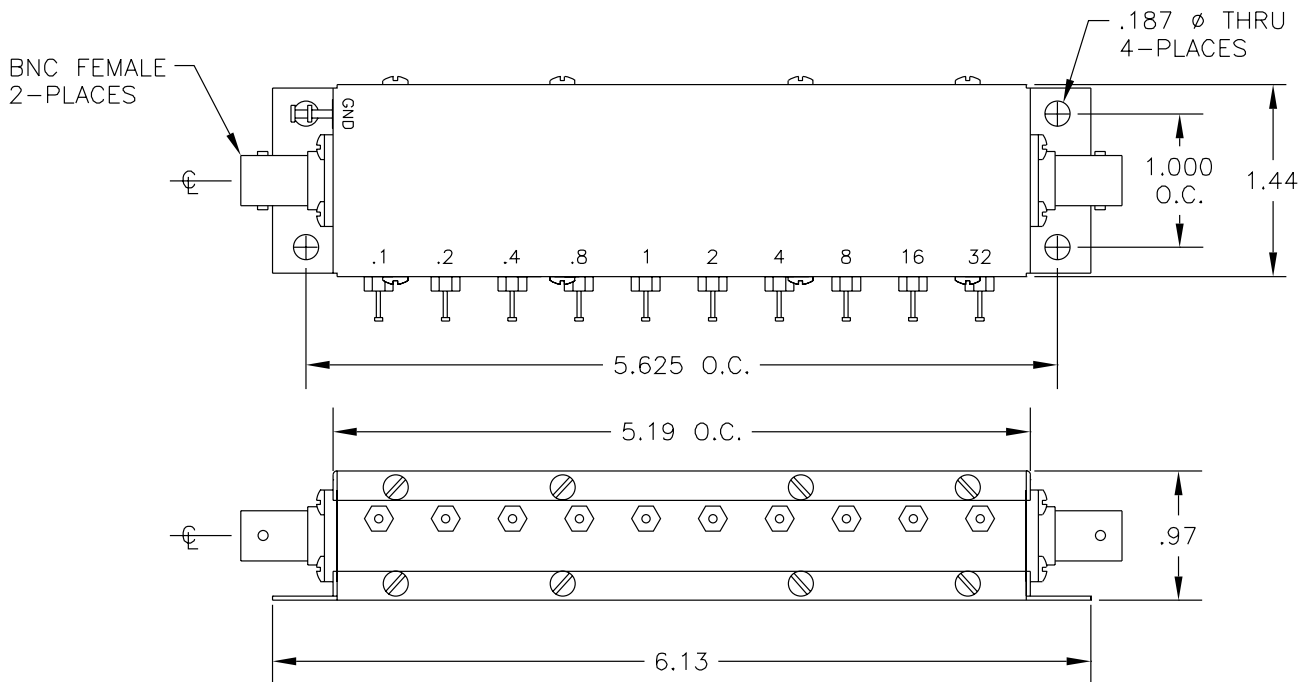


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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connector
50P-1633	DC-1000 MHz	0-64.5 dB / .1, .2, .4, .8, 1,2,4,8, 16 and 32 dB	.1, .2, .4 and .8 dB +/- .05 dB 1, 2 dB +/- .07 dB 4 dB +/- .1 dB 8 dB +/- .15 dB 16, 32 dB +/- .25 dB maximum accumulated error +/- .25 dB or 2%	1.4:1 maximum	4 dB nominal	solder terminals

Impedance	Switching Speed	Operating Temperature	RF Input Power	DC Supply / Control	RF Connectors
50 Ohms	6 milliseconds	-20° C to +85° C	.5 Watts average	+12 Vdc @ 30 mA per relay	BNC, N or SMA female



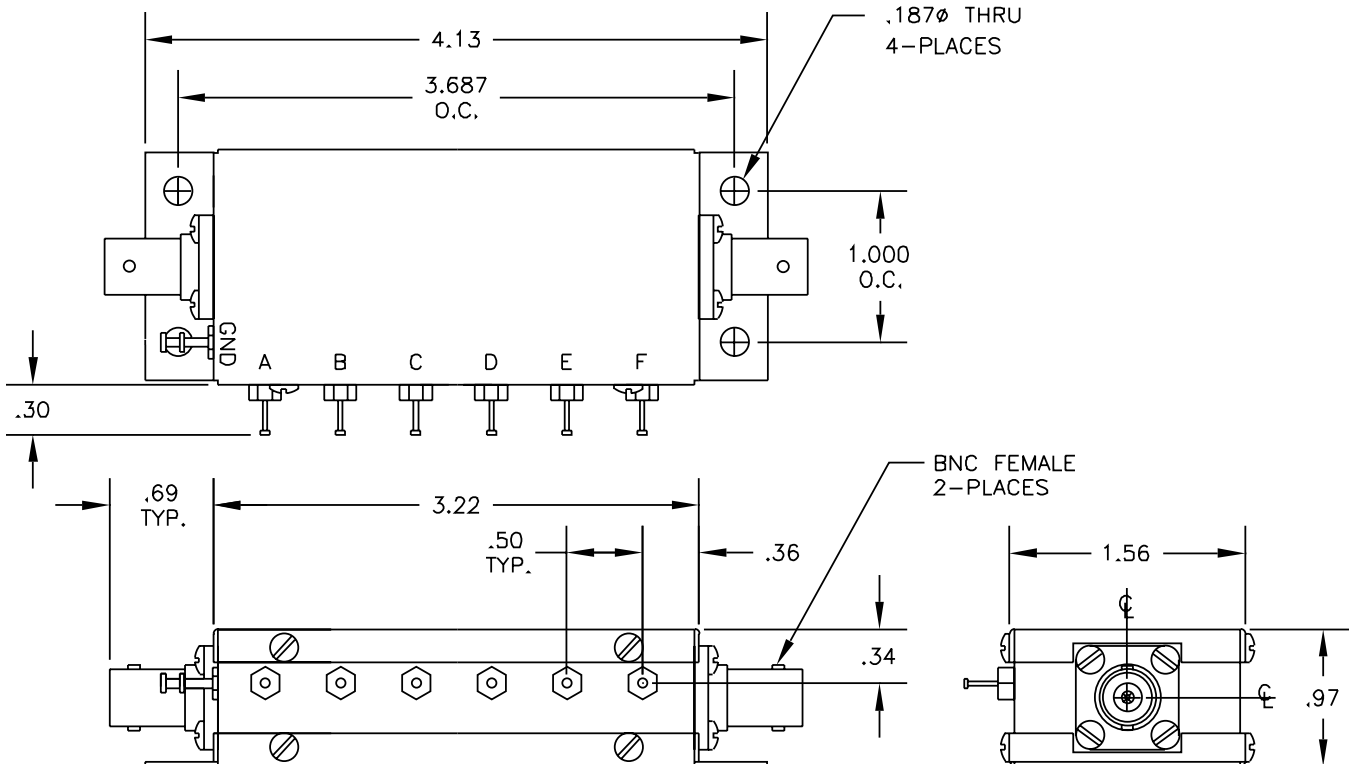
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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connector
50P-077	DC-1000 MHz	0-63 dB / 1, 2, 4, 8, 16 and 32	1,2,4 and 8 dB +/- .2 dB 16 and 32 dB +/- .4 dB maximum accumulative error (0-31 dB) +/- .5 dB maximum accumulative error (32-63 dB) +/- .75 dB	1.4:1 maximum	2.5 dB maximum	solder terminals
50P-990	DC-2500 MHz	0-31.5 dB / .5, 1, 2, 4, 8 and 16 dB	+/- .3 dB or 2% to 1000 MHz +/- .3 dB or 3% to 2500 MHz	1.4:1 maximum	.6 dB maximum @ 15 MHz 2.5 dB maximum @ 1000 MHz 3 dB maximum @ 2000 MHz 3.6 dB maximum @ 2500 MHz	solder terminals

Common Specifications

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

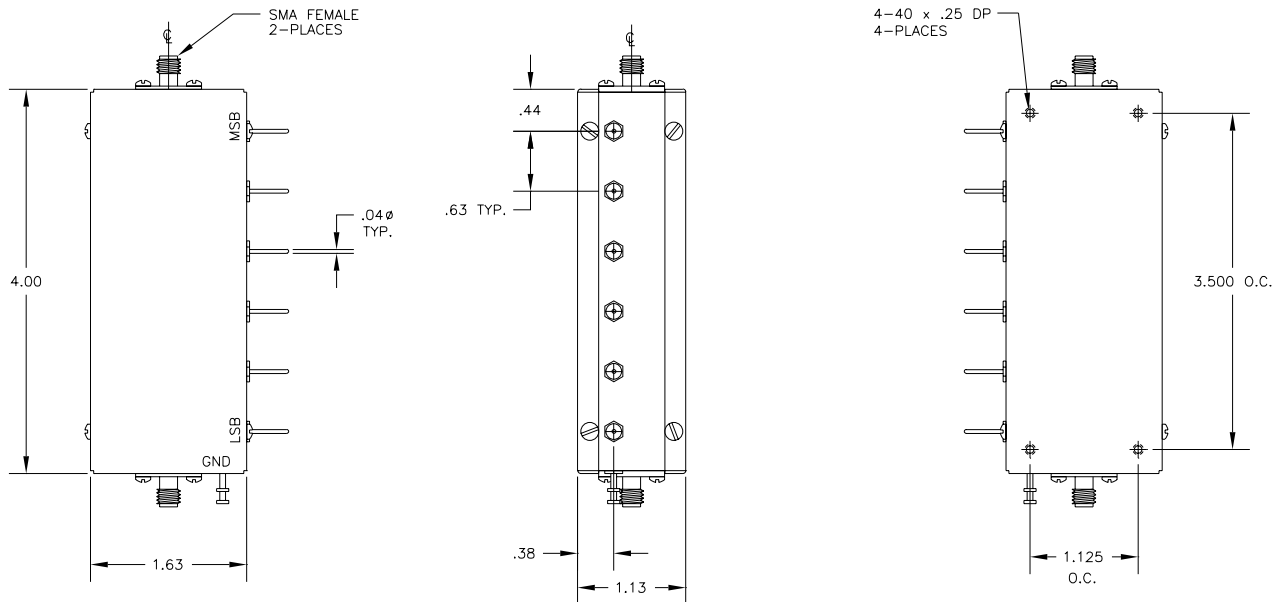


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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	Insertion Loss	RF Input Power	DC Supply/ Control
50P-975	DC-1000 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	+/- .2 dB or 2%	1.25:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz	.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay
50P-1126	DC-1000 MHz	0-31.5 dB / .5,1,2,4,8 and 16 dB	+/- .2 dB or 2%	1.25:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz	1 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay
50P-1161	DC-1000 MHz	0-6.3 dB / .1,.2,.4,.8,1.6 and 3.2 dB	+/- .05 dB or 3%	1.3:1 maximum	1.2 dB maximum @ 500 MHz 2 dB maximum @ 1000 MHz	1 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay
50P-1202	DC-1600 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	+/- .3 dB or 2%	1.4:1 maximum	.8 dB maximum @ 500 MHz 1.5 dB maximum @ 1000 MHz 3.0 dB maximum @ 1600 MHz	.5 Watt average 100 Watts peak	+12 Vdc @ 15 mA per relay

Model	Impedance	Switching Speed	Operating Temperature	DC Control Connector	RF Connectors
50P-975	50 Ohms	6 milliseconds	-20° C to + 85° C	.040 Diameter solder terminals	BNC, SMA, N or TNC (female)
50P-1126	50 Ohms	6 milliseconds	-20° C to + 85° C	.040 Diameter solder terminals	BNC, SMA, N or TNC (female)
50P-1161	50 Ohms	6 milliseconds	-20° C to + 85° C	.040 Diameter solder terminals	BNC, SMA, N or TNC (female)
50P-1202	50 Ohms	6 milliseconds	-20° C to + 85° C	.040 Diameter solder terminals	BNC, SMA, N or TNC (female)

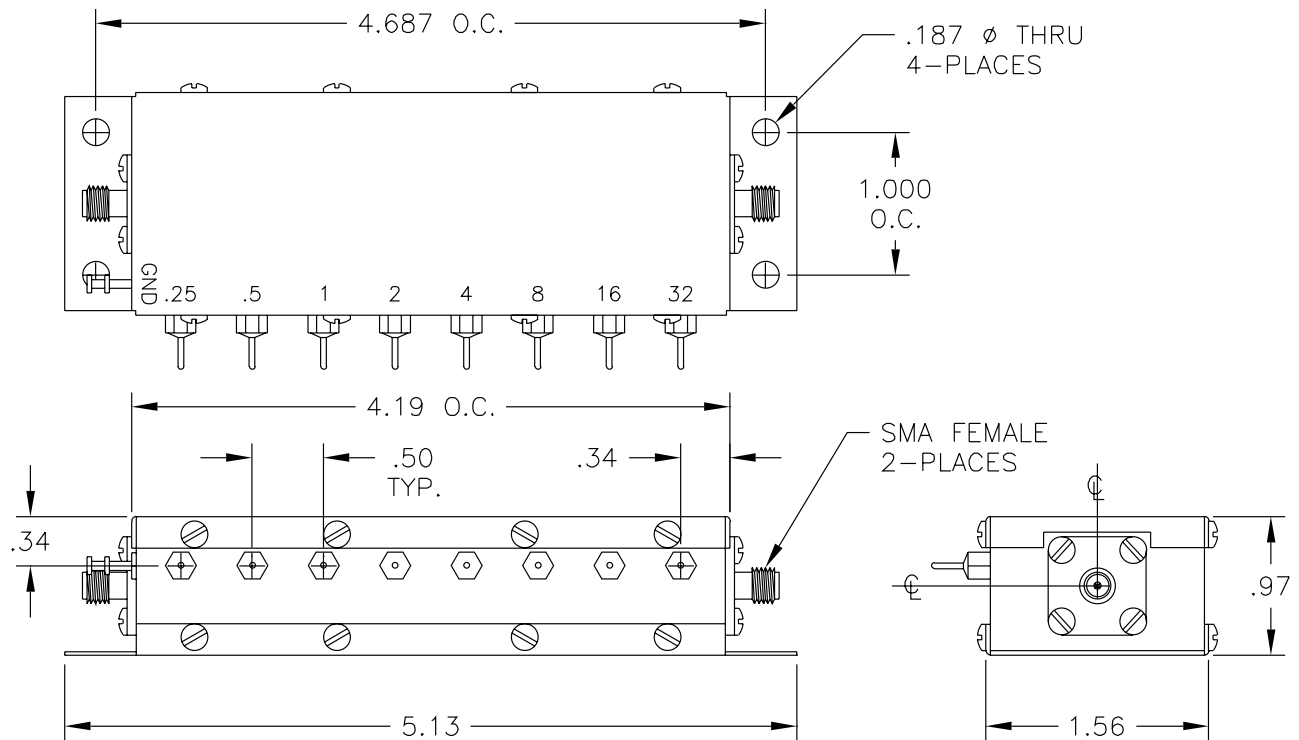


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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connector
50P-1622	DC-1000 MHz	0-63.75 dB / .25, .5, 1, 2, 4, 8, 16 and 32 dB	.25 and .5 dB +/- .1 dB 1, 2, 4 and 8 dB +/- .25 dB 16 and 32 dB +/- .35 dB maximum accumulated error +/- .4 dB or 2%	1.4:1 maximum	3.5 dB maximum	solder terminals

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

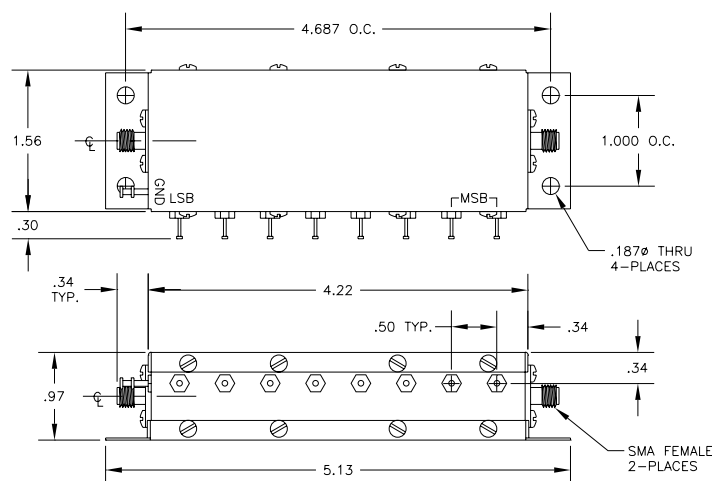


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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	DC Supply / Control	DC Control Connector
50P-076	DC-1000 MHz	0-127 dB / 1,2,4,8,16, 32 and 64 dB	1,2,4 and 8 dB +/- .2dB 16,32 and 64 dB +/- .4 dB maximum accumulated error (0-31 dB) +/- .5 dB maximum accumulated error (32-127 dB) +/- 1 dB	1.4:1 maximum	+12 Vdc @ 30 mA per relay (8 total)	solder terminals
50P-591	DC-3000 MHz	0-85 dB / 1,2,4,8,10,20 and 40 dB	+/- .3 dB or .5% DC-500 MHz +/- .4 dB or 1% 500-1000 MHz +/- .5 dB or 1% 1000-2000 MHz +/- .6 dB or 1.5% 2000-3000 MHz	1.5:1 maximum 1.4:1 typical	+12 Vdc @ 30 mA per relay (8 total)	solder terminals
50P-1128	DC-2000 MHz	0-63.75 dB / .25, .5, 1, 2, 4, 8, 16 and 32 dB	DC-1000 MHz .25, .5 dB +/- .1 dB 1, 2, 4, 8 dB +/- .25 dB 16, 32 dB +/- 2% 1000-2000 MHz .25, .5 dB +/- .15 dB 1, 2, 4, 8 dB +/- .3 dB 16, 32 dB +/- 3%	1.4:1 maximum DC-1000 MHz 1.5:1 maximum 1000-2000 MHz	+12 Vdc @ 30 mA per relay (8 total)	solder terminals

Model	Impedance	Switching Speed	Operating Temperature	RF Input Power	Repeatability	Life (typical)	Insertion Loss	RF Connectors
50P-076	50 Ohms	6 milliseconds	-20° C to +85° C	1 Watt average 1000 Watts peak	+/- .2 dB at any setting	10 million operations per relay	3.5 dB maximum	BNC, N or SMA
50P-591	50 Ohms	6 milliseconds	-40° C to +85° C	.5 Watt average 100 Watts peak	+/- .2 dB at any setting	10 million operations per relay	2.5 dB maximum DC-1000 MHz 3.5 dB maximum 1000-2000 MHz 4.5 dB maximum 2000-3000 MHz	SMA female or N female
50P-1128	50 Ohms	6 milliseconds	-20° C to +85° C	.5 Watt average	+/- .2 dB at any setting	10 million operations per relay	3 dB maximum DC-1000 MHz 3.5 dB maximum 1000-2000 MHz	SMA female



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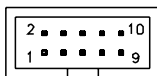
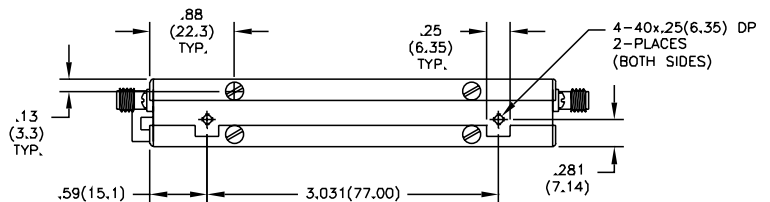
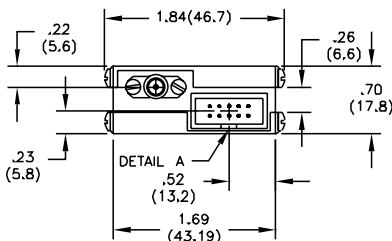
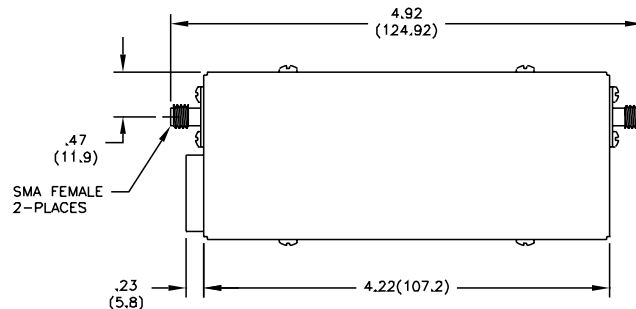
Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR (maximum)	DC Supply	DC Control Connector
50P-1038	DC-2000 MHz	0-127 dB / 1,2,4,8,16,32 and 64 dB	1,2,4,8 dB +/- .2 dB to 1 GHz 16,32,64 dB +/- .4 dB to 1 GHz maximum accumulative error +/- 1 dB to 1 GHz 1,2,4,8 dB +/- .3 dB to 2 GHz 16,32,64 dB +/- .6 dB to 2 GHz maximum accumulative error +/- 1.5 dB to 2 GHz	1.4:1	+15 Vdc @ 32 mA per relay (8 relays total)	T & B # 609-1057

Impedance	Control Logic (7 lines)	Switching Speed	Operating Temperature	RF Input Power	Life (typical)	Insertion Loss	RF Connectors
50 Ohms	TTL low for "zero" setting TTL high for attenuation	6 milliseconds	-40° C to +85° C	1 Watt average	10 million operations per relay	2.7 dB @ 1000 MHz 3.5 dB @ 2000 MHz	SMA female

NOTE: DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS

PIN	FUNCTION
1	NOT USED
2	64dB TTL CONTROL
3	32dB TTL CONTROL
4	16dB TTL CONTROL
5	8dB TTL CONTROL
6	4dB TTL CONTROL
7	2dB TTL CONTROL
8	1dB TTL CONTROL
9	+15 Vdc
10	GND



DETAIL A
T&B #609-1057

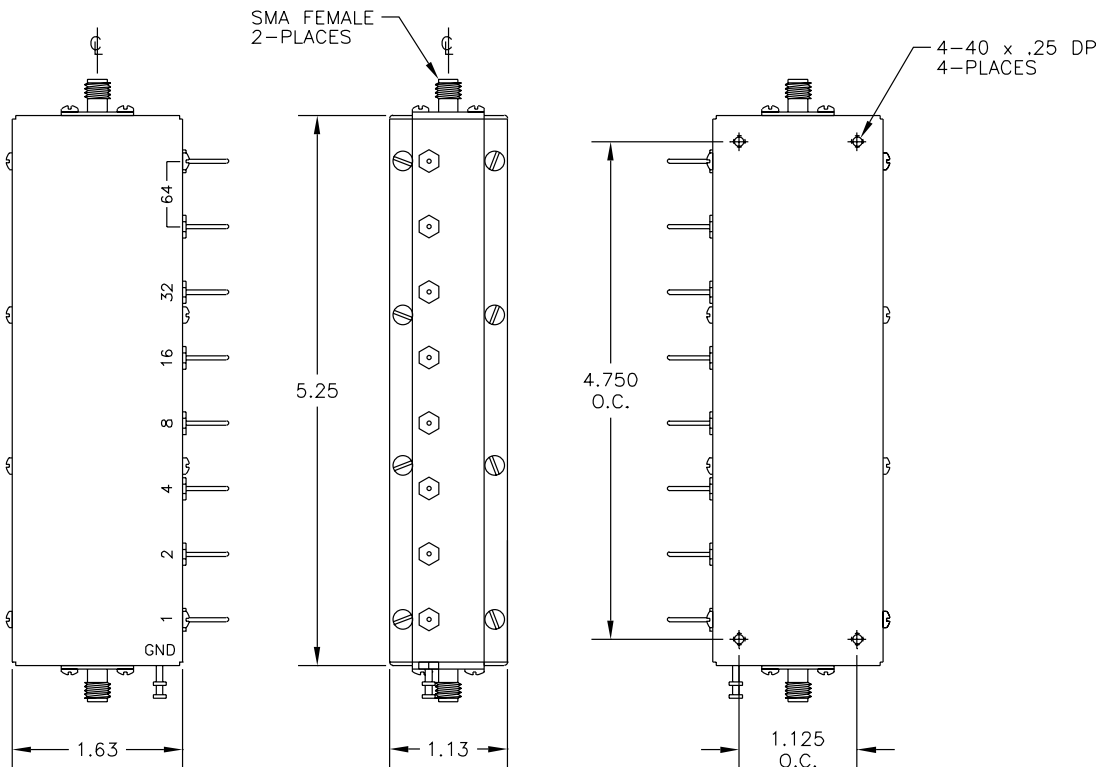
For a DC mating cable,
see page 7-12

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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	DC Supply / Control	DC Control Connector
50P-1233	DC-2000 MHz	0-127 dB / 1,2,4,8,16, 32 and 64 dB	DC-100 MHz +/- .5 dB 100-500 MHz +/- .75 dB 500-1000 MHz +/- 1 dB 1000-2000 MHz +/- 1dB or 2% or programmed	1.5:1 maximum	+12 Vdc @ 30 mA per relay	solder terminals

Impedance	Switching Speed	Operating Temperature	RF Input Power	Repeatability	Life (typical)	Insertion Loss	RF Connectors
50 Ohms	6 milliseconds	-20° C to +85° C	1 Watt average 1000 Watts peak	+/- .25 dB at any setting	10 million operations per relay	4.5 dB maximum	BNC, TNC, SMA or N female

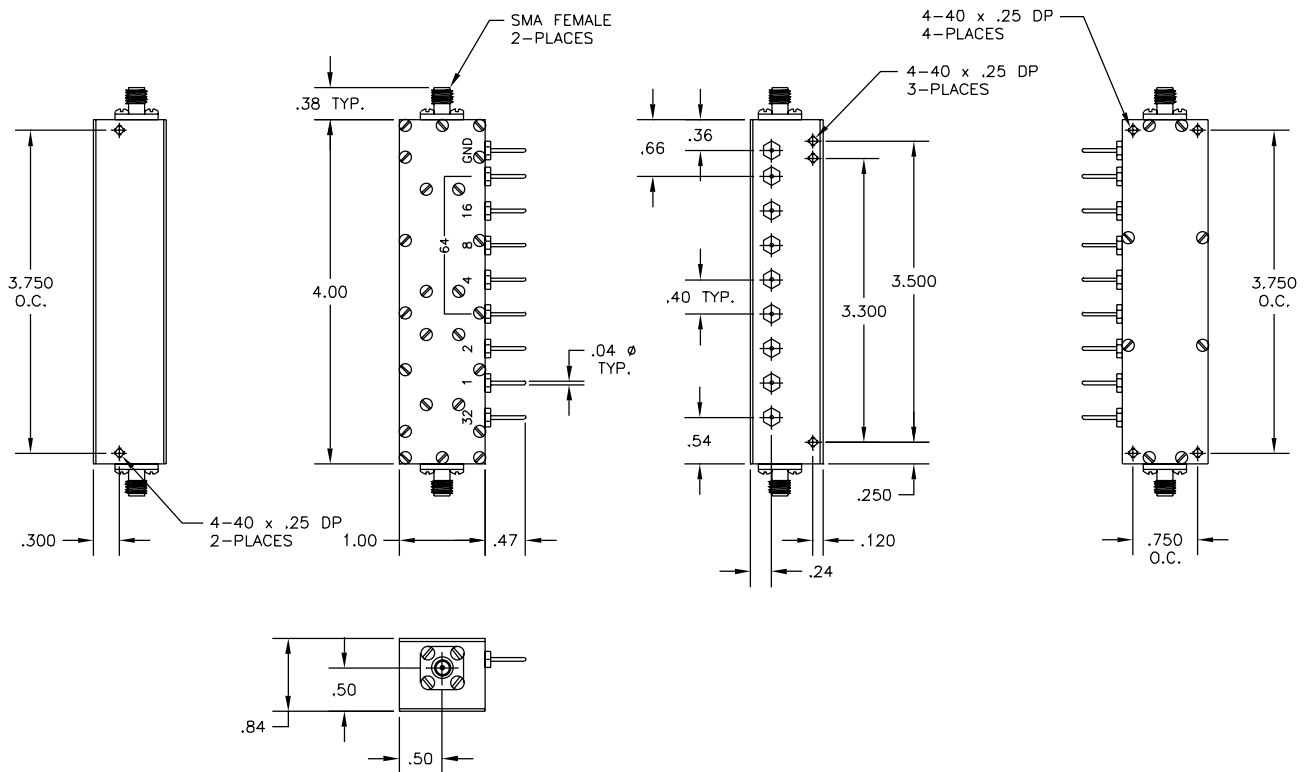


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Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connector
50P-1436	DC-2500 MHz	0-127 dB / 1, 2, 4, 8, 16, 32 and 64 dB	DC-500 MHz +/- .25 dB or .75% 500-1000 MHz +/- .25 dB or 1.25% 1000-2500 MHz +/- .35 dB or 2.25%	1.4:1 maximum	4 dB maximum	solder terminals

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



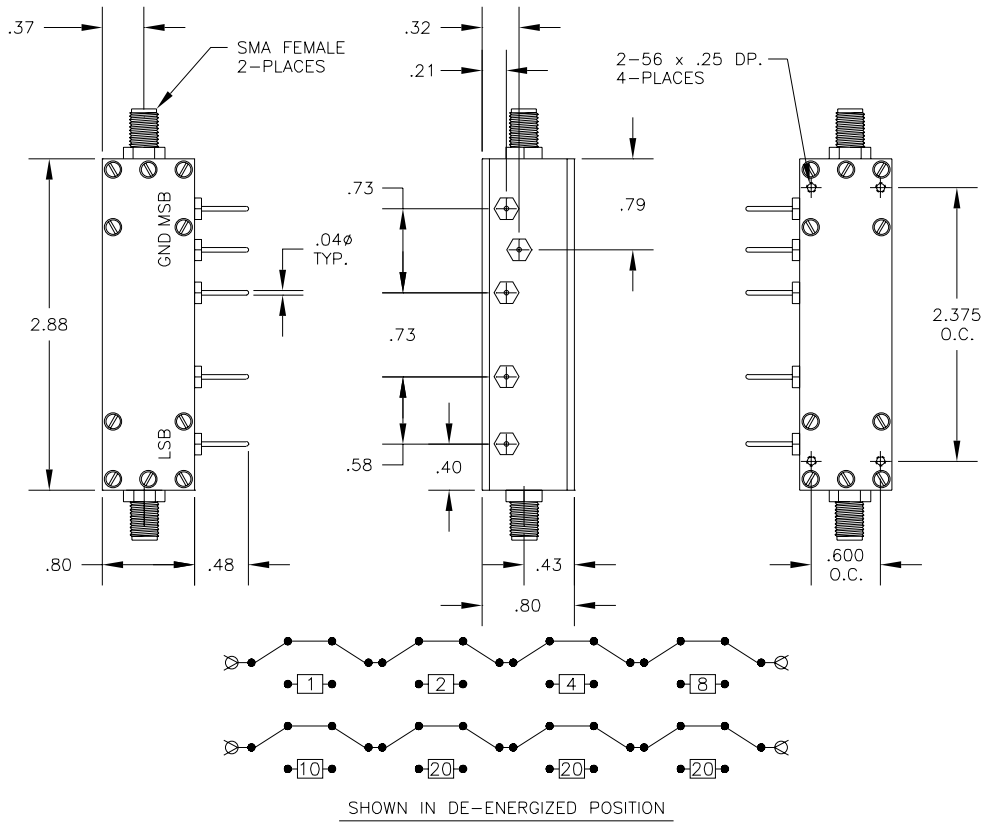
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Wideband Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Supply / Control	DC Control Connector
50P-766	DC-5000 MHz	0-70 dB / 10,20,20 and 20 dB	+/- .3 dB or 1% DC-1000 MHz +/- .5 dB or 1% 1000-3000 MHz +/- .5 dB or 2% 3000-5000 MHz	1.3:1 maximum to 2000 MHz 1.5:1 maximum to 5000 MHz	2.5 dB maximum to 2000 MHz 3.5 dB maximum to 5000 MHz	+12 Vdc @ 30 mA per relay	.040 Diameter solder terminals
50P-847	DC-5000 MHz	0-15 dB / 1,2,4 and 8 dB	+/- .3 dB or 3% DC-1000 MHz +/- .5 dB or 4% 1000-3000 MHz +/- .5 dB or 5% 3000-5000 MHz	1.3:1 maximum to 2000 MHz 1.5:1 maximum to 5000 MHz	2.5 dB maximum to 2000 MHz 4 dB maximum to 5000 MHz	+12 Vdc @ 30 mA per relay	.040 Diameter solder terminals
50P-1516	DC-6000 MHz	0-70 dB / 10,20,20 and 20 dB	+/- .3 dB or 2% DC-2000 MHz +/- .5 dB or 4% 2000-6000 MHz	1.5:1 maximum	2.5 dB maximum to 2000 MHz 3.5 dB maximum to 6000 MHz	+12 Vdc @ 30 mA per relay	.040 Diameter solder terminals

Common Specifications

Impedance	Switching Speed	Operating Temperature	RF Input Power	RF Connectors
50 Ohms	10 milliseconds	-20° C to +85° C	.5 Watt average 100 Watts peak	SMA female

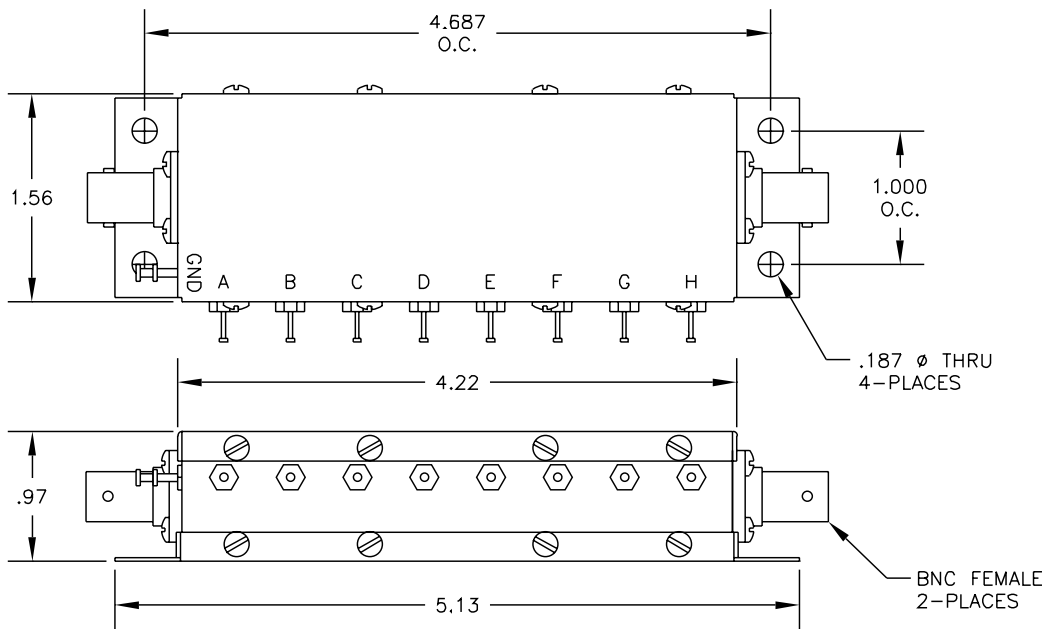


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75 Ohm Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range/Steps	Attenuation Accuracy	VSWR	Insertion Loss	DC Control Connector
75P-033	DC-1000 MHz	0-127 dB / 1, 2, 4, 8, 16, 32 and 64 dB	DC-100 MHz +/- .5 dB 100-500 MHz +/- .5 dB or 1% 500-1000 MHz +/- .5 dB or 2%	1.5:1 maximum	2.5 dB nominal	solder terminals
75P-089	DC-500 MHz	0-63.75 dB / .25, .5, 1, 2, 4, 8, 16 and 32 dB	DC-100 MHz +/- .1 dB or 1% 100-500 MHz +/- .2 dB or 1%	1.25:1 maximum	2 dB nominal	solder terminals

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

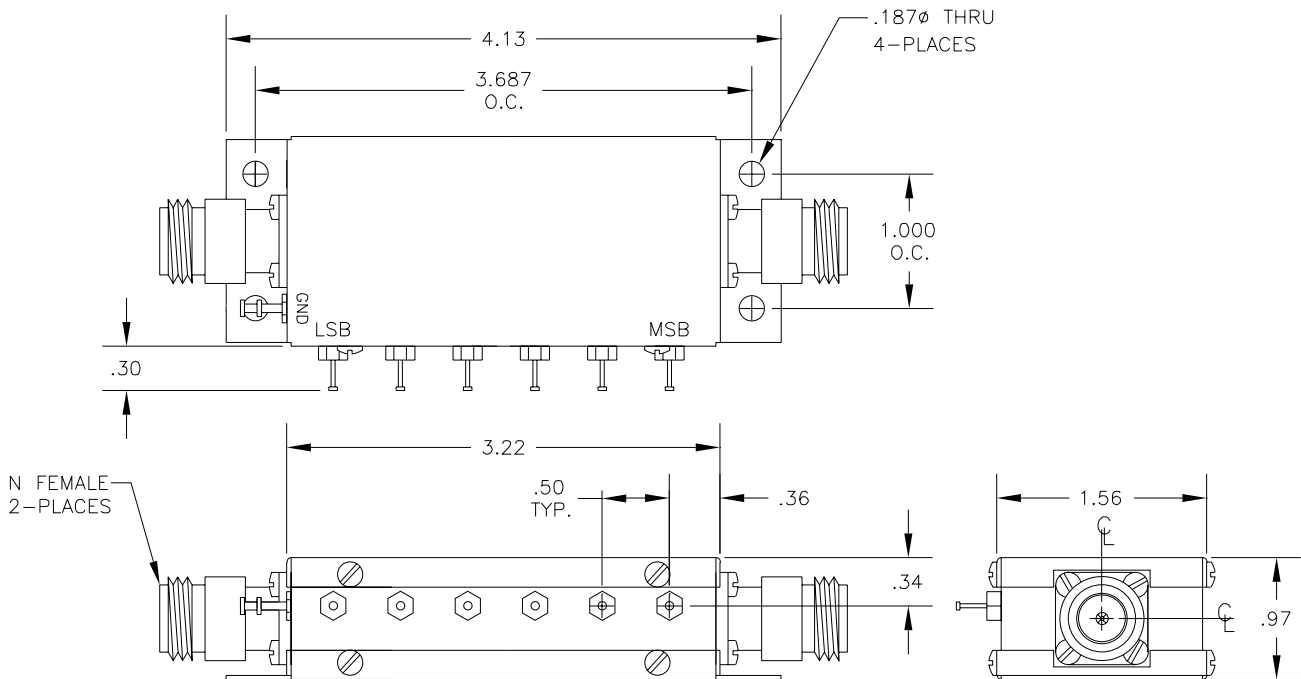
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75 Ohm Relay Programmable Attenuators

Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	Insertion Loss	VSWR	DC Control Connector
75P-022	DC-1000 MHz	0-63 dB / 1,2,4,8,16 and 32 dB	+/- .3 dB DC-100 MHz +/- .3 dB or 1% 100-500 MHz +/- .3 dB or 1.5% 500-1000 MHz	2.2 dB maximum	1.4:1 maximum	solder terminals
75P-093	DC-1000 MHz	0-110 dB / 10,20,20,20,20 and 20 dB	+/- .3 dB DC-100 MHz +/- .3 dB or 1% 100-500 MHz +/- .5 dB or 1% 500-1000 MHz	2.2 dB maximum	1.4:1 maximum	solder terminals

Common Specifications

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



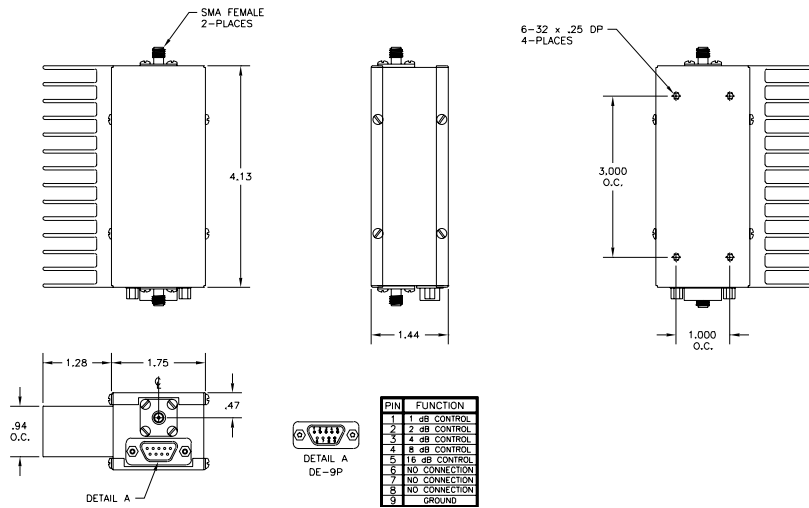
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High Power Programmable Attenuators

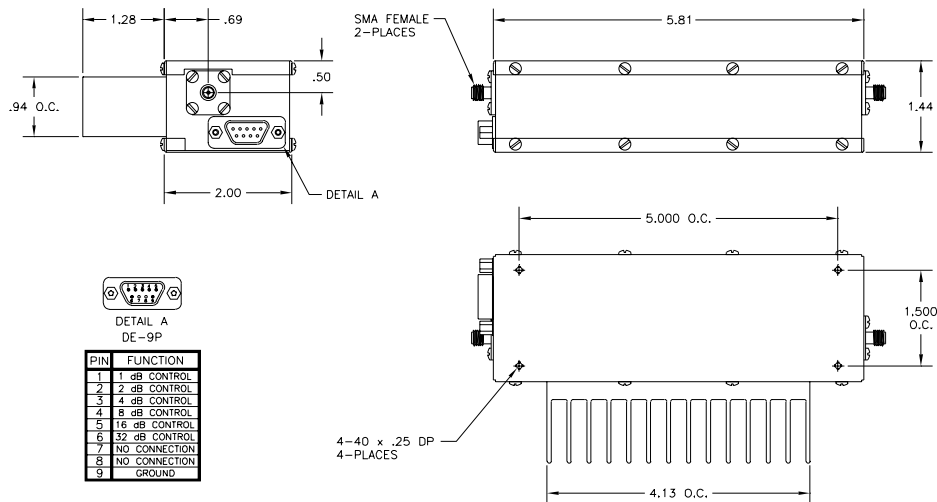
Model	Frequency Range	Attenuation Range / Steps	Attenuation Accuracy	Insertion Loss Maximum	VSWR Maximum	DC Control Connector
50P-1404	DC-2000 MHz	0-31 dB in 1 dB steps / 1,2,4,8 and 16 dB	+/- .5 or 2%	3 dB	1.4:1	DE-9P
50P-1494	DC-2200 MHz	0-63 dB in 1 dB steps / 1,2,4,8,16 and 32	+/- .5 dB 1,2,4,8,16 and 32 dB Accumulated error +/- 1 dB or 3% of programmed	4 dB	1.5:1	DE-9P

Model	Impedance	Switching Speed	Operating Temperature	RF Input Power	DC Supply / Control	RF Connectors
50P-1404	50 Ohms	6 milliseconds	-20° C to +85° C	10 Watts average 100 Watts peak	+12 Vdc @ 30 mA per step	BNC, TNC, N or SMA
50P-1494	50 Ohms	10 milliseconds	-20° C to +60° C	10 Watts average 100 Watts peak	+12 Vdc @ 30 mA per step	BNC, TNC, N or SMA

50P-1404



50P-1494



For a DC mating cable, see page 7-12

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