Introduction

Attenuators are linear passive bidirectional transition line components designed to be inserted between two coaxial lines in order to reduce the input power in a matched system by a predetermined ratio. This ratio is expressed in logarithmic terms.
3 dB as a power ratio is 2, 6 dB is 4, 20 dB is 100 and 30 dB is 1000 etc...
Attenuators are applied in Test & Measurement, defense, space and thermal vacuum applications.

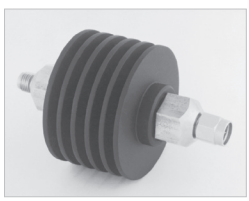
FEATURES
- Broadband
- Low, Medium and High power
- Low VSWR

BENEFITS
- High repeatability

LOW POWER ATTENUATORS

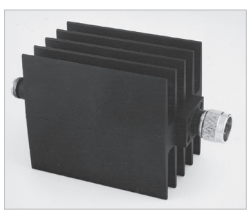
Power	0.5 to 2 Watts
Connectors	BNC, QN, N, SMA, SMA 2.9, SMB, TNC, 7/16
Frequency range	DC to 40 GHz
Attenuation range	0 to 60 dB

MEDIUM POWER ATTENUATORS



Power	3 to 50 Watts
Connectors	BNC, N, SMA, TNC, 7/16
Frequency range	DC to 18 GHz
Attenuation range	0 to 30 dB

HIGH POWER ATTENUATORS



Power	80 to 100 Watts
Connectors	N, SMA, TNC, 7/16
Frequency range	DC to 6 GHz
Attenuation range	0 to 20 dB

ATTENUATORS FOR SPACE / THERMAL VACUUM APPLICATIONS

Power	1 to 2 Watts
Connectors	SMA, SMA 2.9
Frequency range	DC to 40 GHz
Attenuation range	0 to 20 dB

Attenuators for Space / thermal vacum applications are not detailled in this document.
Please consult us.

Low power attenuators,up to 2 watts

7/16 - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.3	17.7	1	100	xx	± 0.5 [1]	R412 8xx 000
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] ± 1 for xx = 20

BNC - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
2	1.2	20.8	2	100	xx	± 0.35 [1]	R412 4xx 000
Available attenuation value: xx = 00 to 20 step 1, 30, 40 and 50 dB							
3	1.3	17.7	1	100	xx	± 0.5 [2]	R412 4xx 124
Available attenuation value: xx = 00 to 20 step 1 dB							
8	1.25	19.1	2	100	xx	± 0.5 [3]	R414 4xx 000
Available attenuation value: xx = 00 to 15 step 1, 20, 25, 30, 40 - 50 and 60 dB							

[1] up to xx = 14, [2] up to xx = 15, [3] up to xx = 25

N - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
2	1.15	23.1	2	100	xx	± 0.35 [1]	R412 7xx 000
Available attenuation value: xx = 00 to 15 step 1, 20, 30, 40 and 50 dB							
6	1.4	15.6	1	100	xx	± 0.5 [1]	R412 700 124
Available attenuation value: xx = 00 to 20 dB step 1							
12.4	1.4	15.6	2	100	xx	± 0.7 [2]	R414 7xx 000
Available attenuation value: xx = 00 to 15 step 1, 20, 25, 30, 40 - 50 and 60 dB							
18	1.35	16.5	2	100	xx	± 0.4 [3]	R414 7xx 161
Available attenuation value: xx = 00 to 20 dB step 1							

[1] up to xx = 15, [2] up to xx = 20, [3] up to xx = 6

QMA - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
6	1.3	17.7	1	100	xx	± 0.5 [1]	R411 7xx 124
Available attenuation value: xx = 00 to 20 dB step 1							

[1] up to xx = 15

QN - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.3	17.7	1	100	xx	± 0.5 [1]	R412 3xx 124
Available attenuation value: xx = 00 to 20 dB step 1							

[1] up to xx = 15

SMA - 50 OHMS, MALE TO FEMALE, .75IN.

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
6	1.4	15.6	1	100	xx	± 0.5 [1]	R411 8xx 124
Available attenuation value: xx = 00 to 20 dB step 1							
12.4	1.3	17.7	2	100	xx	± 0.5 [2]	R411 8xx 119
Available attenuation value: xx = 00 to 20 step 1 and 30 dB							
18	1.35	16.5	2	100	xx	± 0.7 [3]	R411 8xx 121
Available attenuation value: xx = 00 to 20 step 1 and 30 dB							

[1] up to xx = 15, [2] up to xx = 10, [3] up to xx = 7

Low power attenuators,up to 2 watts

7/16 - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.3	17.7	1	100	xx	± 0.5 [1]	R412 8xx 000
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] ± 1 for xx = 20

BNC - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
2	1.2	20.8	2	100	xx	± 0.35 [1]	R412 4xx 000
Available attenuation value: xx = 00 to 20 step 1, 30, 40 and 50 dB							
3	1.3	17.7	1	100	xx	± 0.5 [2]	R412 4xx 124
Available attenuation value: xx = 00 to 20 step 1 dB							
8	1.25	19.1	2	100	xx	± 0.5 [3]	R414 4xx 000
Available attenuation value: xx = 00 to 15 step 1, 20, 25, 30, 40 - 50 and 60 dB							

[1] up to xx = 14, [2] up to xx = 15, [3] up to xx = 25

N - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
2	1.15	23.1	2	100	xx	± 0.35 [1]	R412 7xx 000
Available attenuation value: xx = 00 to 15 step 1, 20, 30, 40 and 50 dB							
6	1.4	15.6	1	100	xx	± 0.5 [1]	R412 700 124
Available attenuation value: xx = 00 to 20 dB step 1							
12.4	1.4	15.6	2	100	xx	± 0.7 [2]	R414 7xx 000
Available attenuation value: xx = 00 to 15 step 1, 20, 25, 30, 40 - 50 and 60 dB							
18	1.35	16.5	2	100	xx	± 0.4 [3]	R414 7xx 161
Available attenuation value: xx = 00 to 20 dB step 1							

[1] up to xx = 15, [2] up to xx = 20, [3] up to xx = 6

QMA - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
6	1.3	17.7	1	100	xx	± 0.5 [1]	R411 7xx 124
Available attenuation value: xx = 00 to 20 dB step 1							

[1] up to xx = 15

QN - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.3	17.7	1	100	xx	± 0.5 [1]	R412 3xx 124
Available attenuation value: xx = 00 to 20 dB step 1							

[1] up to xx = 15

SMA - 50 OHMS, MALE TO FEMALE, .75IN.

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
6	1.4	15.6	1	100	xx	± 0.5 [1]	R411 8xx 124
Available attenuation value: xx = 00 to 20 dB step 1							
12.4	1.3	17.7	2	100	xx	± 0.5 [2]	R411 8xx 119
Available attenuation value: xx = 00 to 20 step 1 and 30 dB							
18	1.35	16.5	2	100	xx	± 0.7 [3]	R411 8xx 121
Available attenuation value: xx = 00 to 20 step 1 and 30 dB							

[1] up to xx = 15, [2] up to xx = 10, [3] up to xx = 7

Low power attenuators,up to 2 watts

SMA - 50 OHMS, MALE TO FEMALE, .86IN.

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
4	1.15	23.1	2	100	xx	± 0.3 [1]	R413 8xx 115
Available attenuation value: xx = 00 to 20 step 1, 30, 40 - 50 and 60 dB							
18	1.35	16.5	2	100	xx	± 0.3 [1]	R413 8xx 000
Available attenuation value: xx = 00 to 20 step 1, 25, 30, 35, 40, 45 - 50, 55 and 60 dB							
26.5	1.5	14.0	2	100	xx	± 0.5 [1]	R413 8xx 121
Available attenuation value: xx = 00 to 20 step 1, 25 and 30 dB							

[1] up to xx = 6

SMA 2.9 - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
40	1.6	12.7	2	100	xx	± 0.8	R413 3xx 000
Available attenuation value: xx = 00 to 10 step 1 and 20 dB							

SMB - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
8	1.3	17.7	2	100	xx	± 0.5	R410 2xx 121
Available attenuation value: xx = 03, 06, 10 and 20 dB							

SMC - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
8	1.3	17.7	2	100	xx	± 0.5	R410 1xx 121
Available attenuation value: xx = 03, 06, 10 and 20 dB							

TNC - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
2	1.15	23.1	2	100	xx	± 0.35 [1]	R412 5xx 000
Available attenuation value: xx = 00 to 15 step 1, 20, 30, 40 and 50 dB							
3	1.3	17.7	1	100	xx	± 0.5 [2]	R412 5xx 124
Available attenuation value: xx = 00 to 20 dB step 1							
12.4	1.3	17.7	2	100	xx	± 0.7 [3]	R414 5xx 000
Available attenuation value: xx = 00 to 15 step 1, 20, 25, 30, 40 - 50 and 60 dB							
18	1.35	16.5	2	100	xx	± 0.4 [4]	R414 5xx 161
Available attenuation value: xx = 00 to 20 dB step 1							

[1] up to xx = 15, [2] up to xx = 14, [3] up to xx = 6

Medium power attenuators,up to 30 watts

7/16 - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
4	1.35	16.5	25	5,000	xx	± 0.6 [1]	R4203xx110
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] ± 0.6 for xx = 20

BNC - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
4	1.3	17.7	15 [2]	250	xx	± 0.5	R4154xx000
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[2] 12 for xx= 06 , 10 for xx = 10 and 20

N - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
4	1.35	16.5	25	5,000	xx	± 0.6 [1]	R417 3xx 110
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
4	1.35	16.5	30	5,000	xx	± 0.6 [1]	R417 3xx 130
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
8	1.25	19.1	15 [2]	250	xx	± 0.3	R415 7xx 000
Available attenuation value: xx = 03, 06, 10 and 20 dB							
18	1.4	15.6	15 [2]	300	xx	± 0.5	R416 0xx 000
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10
[2] 12 for xx= 06 , 10 for xx = 10 and 20

SMA - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
4	1.35	16.5	25	5,000	xx	± 0.6 [1]	R417 3xx 110
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
4	1.35	16.5	30	5,000	xx	± 0.6 [1]	R417 3xx 130
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
8	1.25	19.1	15 [2]	250	xx	± 0.3	R415 7xx 000
Available attenuation value: xx = 03, 06, 10 and 20 dB							
18	1.4	15.6	15 [2]	300	xx	± 0.5	R416 0xx 000
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10
[2] 12 for xx= 06 , 10 for xx = 10 and 20

TNC - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
4	1.35	16.5	25	5,000	xx	± 0.6 [1]	R417 5xx 110
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
4	1.35	16.5	30	5,000	xx	± 0.6 [1]	R417 5xx 130
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
8	1.25	19.1	15 [2]	250	xx	± 0.3 [1]	R415 3xx 000
Available attenuation value: xx = 03, 06, 10 and 20 dB							
18	1.4	15.6	15 [2]	300	xx	± 0.5	R416 8xx 000
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10
[2] 12 for xx= 06 , 10 for xx = 10 and 20

High power attenuators,up to 100 watts

7/16 - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R420 0xx 110
Available attenuation value: xx = 03, 06, 10 and 20 dB							
3	1.3	17.7	100	5,000	xx	± 1 [1]	R420 7xx 110
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

N - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 0xx 110
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 7xx 118
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

N - 50 OHMS, MALE TO FEMALE, CONDUCTION AND CONVECTION COOLING

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	40 / 50	5,000	xx	± 0.7 [1]	R417 0xx 120
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	80 / 100	5,000	xx	± 1	R417 7xx 128
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

N - 50 OHMS, MALE TO FEMALE, CONDUCTION COOLING

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 0xx 130
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 7xx 138
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

SMA - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 1xx 110
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 8xx 118
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

SMA - 50 OHMS, MALE TO FEMALE, CONDUCTION AND CONVECTION COOLING

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 1xx 120
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 8xx 128
Available attenuation value: xx = 03, 06, 10 and 20 dB							

High power attenuators,up to 100 watts

SMA - 50 OHMS, MALE TO FEMALE, CONDUCTION COOLING

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 1xx 130
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 8xx 138
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

SMA - 50 OHMS, MALE TO FEMALE, CONDUCTION COOLING

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 1xx 130
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 8xx 138
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

TNC - 50 OHMS, MALE TO FEMALE

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 2xx 110
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 9xx 118
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

TNC - 50 OHMS, MALE TO FEMALE, CONDUCTION AND CONVECTION COOLING

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 2xx 120
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 9xx 128
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10

TNC - 50 OHMS, MALE TO FEMALE, CONDUCTION COOLING

Frequency DC to (GHz)	VSWR max.	Return loss min. (dB)	Power rating (W)		Nom. Attenuation (dB)	Max dev.	Part Number
			Avg. (W)	Peak (W)			
3	1.35	16.5	50	5,000	xx	± 0.7 [1]	R417 2xx 130
Available attenuation value: xx = 03, 06, 10, 20 and 30 dB							
2	1.25	19.1	100	5,000	xx	± 1	R417 9xx 138
Available attenuation value: xx = 03, 06, 10 and 20 dB							

[1] up to xx = 10