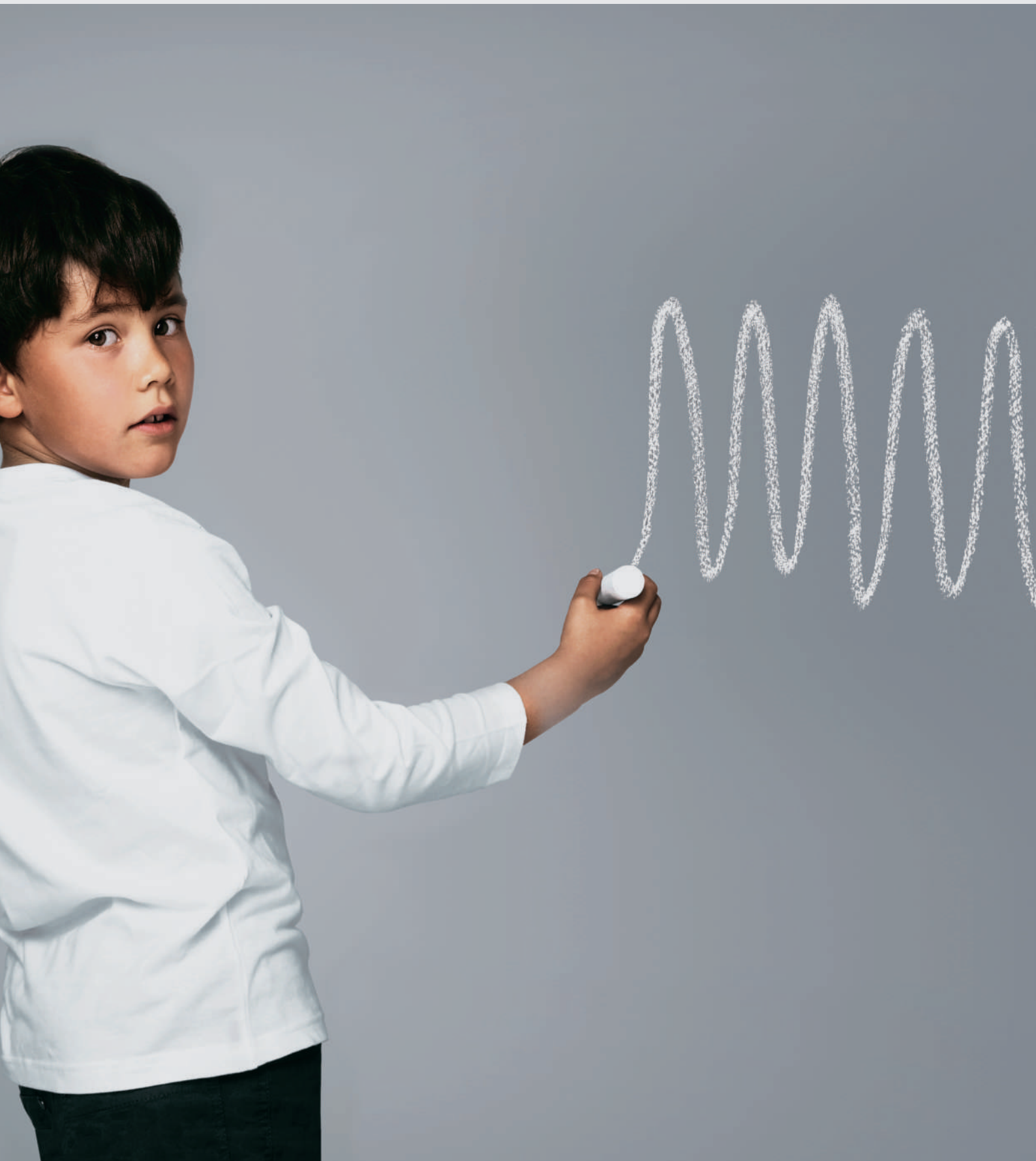


# RF components

Edition 2019



Be precise





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## Your partner for system solutions

The HUBER+SUHNER Group is a leading global supplier of components and systems for electrical and optical connectivity. Our customers in communications, industrial and transportation markets appreciate that we are specialists with detailed knowledge of practical applications. We offer technical expertise in radio frequency technology, fiber optics and low frequency under one roof, thus providing a unique basis for continual innovation focused on the needs of our customers all over the world.

## RF and microwave components

HUBER+SUHNER's extensive range of high-quality components are matched to the various needs in the field of test and measurement. All these products are distinguished by their high performance and stable characteristics - the result of years of experience in the development and production of radio frequency components.

This HUBER+SUHNER short form catalogue presents you an extract of the wide range of components. If you have a specific need and do not see it in this catalogue, please contact your HUBER+SUHNER representative for assistance.



Fixed attenuators

# Fixed attenuators

Low, medium and high power

Product description	6
Low power attenuators, up to 2 Watts	
BNC	7
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N	12
SMA	14
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# Fixed attenuators

## Product description

RF attenuators are used to reduce the power of a signal without causing distortion of its waveform.

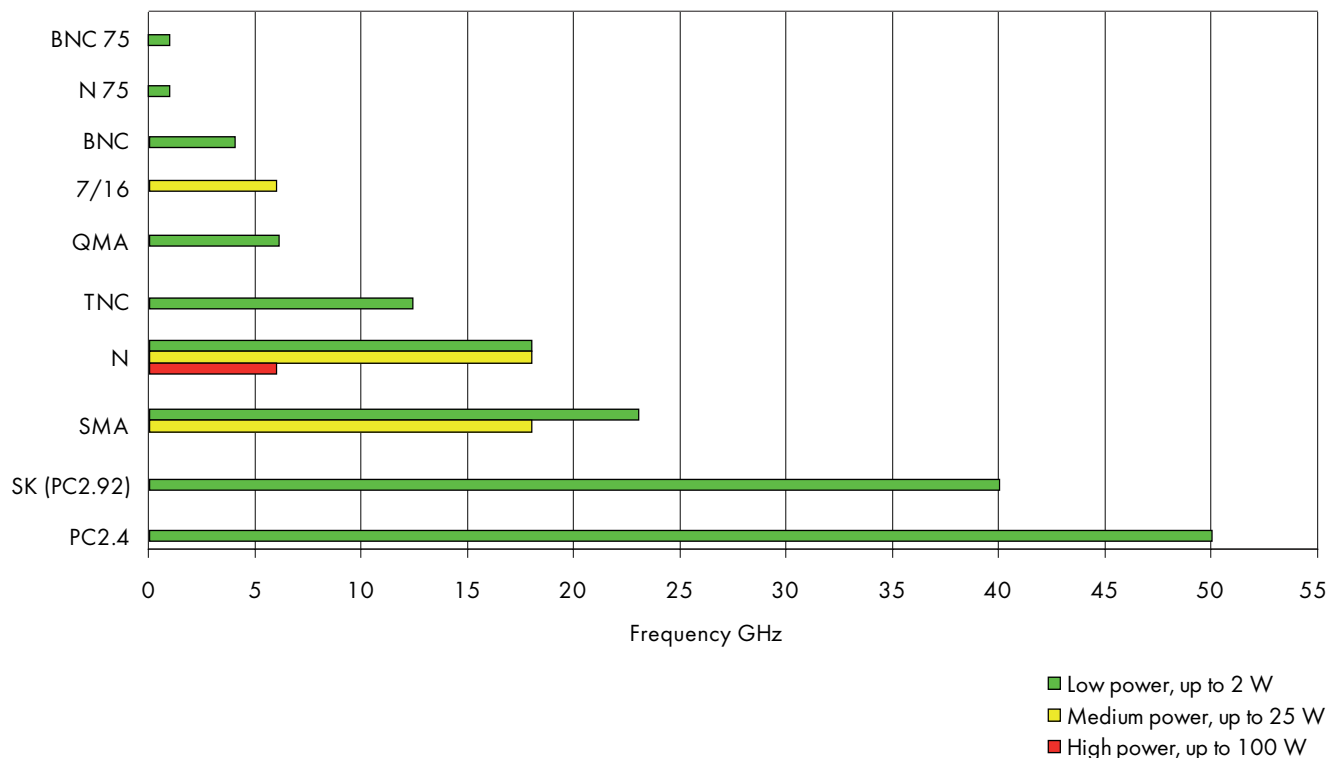
They are used in many test & measurement and communication applications

- Power adjuster between different channels or inline subsystems
- As a protection for the input of the test equipment to reduce threatening RF power
- To improve the impedance matching between subsystems or to the test instrumentation

## Features

- 50  $\Omega$  or 75  $\Omega$  impedance
- Fixed attenuation level from 1 dB up to 30 dB
- Various bandwidth to improve the impedance matching between subsystems of its waveform
- Wide range of interfaces
- Made to female connectorisation

## Attenuators quick selection chart



## Product details

Specific data sheets and outline drawings are available on request or on our website [hubersuhner.com](http://hubersuhner.com).

## Power handling capability

The referenced **average input power rating** is mainly applicable at 25 °C ambient temperature. For higher ambient temperature a certain power derating may be required. Please see detailed product specification. Medium and high power products shall be mounted in such a way that free air convection around heat sink is given to assure performance.

# Low power attenuators, up to 2 Watts

BNC, 50 Ω, connector configuration male to female



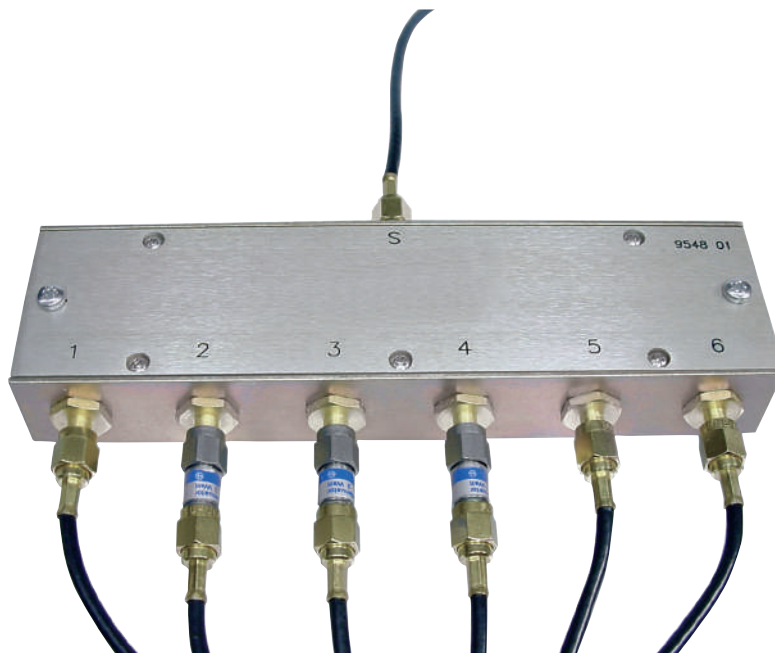
Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
4	1.2	20.8	2	3	6803.01.A	22550177
				6	6806.01.A	22550178
				10	6810.01.A*	22550179
				20	6820.01.A*	22550180
				30	6830.01.A*	22550181

\* 1 Watt power rating

BNC, 75 Ω, connector configuration male to female



Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
1	1.15	23.1	1	3	6903.02.A	22550074
				6	6906.02.A	22550088
				0.4	6910.02.A	22550124
	1.2	20.8	0.4	20	6920.02.A	22550138



# Low power attenuators, up to 2 Watts

N, 50 Ω, connector configuration male to female



Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
6	1.25	19.1	2	1	6801_N-50-1	84066765
				2	6802_N-50-1	84066769
				3	6803_N-50-1	84066770
				4	6804_N-50-1	84066772
				5	6805_N-50-1	84066786
				6	6806_N-50-1	84066798
				7	6807_N-50-1	84066801
				8	6808_N-50-1	84066802
				9	6809_N-50-1	84066808
				10	6810_N-50-1	84066809
				15	6815_N-50-1	84066814
				20	6820_N-50-1	84066815
				30	6830_N-50-1	84066817
12.4	1.35	16.5	2	1	6801.17.A	22641535
				2	6802.17.A	22641536
	1.25	19.1	2	3	6803.17.A	22550182
				4	6804.17.A	22641537
				5	6805.17.A	22641538
				6	6806.17.A	22550183
				7	6807.17.A	22641539
				8	6808.17.A	22641540
				9	6809.17.A	22641541
				10	6810.17.A*	22550185
				20	6820.17.A*	22550186
				30	6830.17.A*	22550187
				18	1.25	19.1
6	6806.17.B	22550189				
10	6810.17.B*	22550190				
20	6820.17.B*	22550191				
30	6830.17.B*	22550192				

\* 1 Watt power rating



# Low power attenuators, up to 2 Watts

PC2.4, 50  $\Omega$ , connector configuration male to female



Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
50	1.75	11.3	0.5	3	6603_PC24-50-1	84058353
				6	6606_PC24-50-1	84058358
				10	6610_PC24-50-1	84058360
				20	6620_PC24-50-1	84058363

QMA, 50  $\Omega$ , connector configuration male to female



Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
6	1.2	20.8	2	3	6803_QMA-50-2	84058454
				6	6806_QMA-50-2	84058457
				10	6810_QMA-50-2	84058461
				20	6820_QMA-50-2	84058212

SK (PC2.92), 50  $\Omega$ , connector configuration male to female



Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
40	1.4	15.6	0.5	3	6603_SK-50-1	84076856
				6	6606_SK-50-1	84076855
				10	6610_SK-50-1	84076854
				20	6620_SK-50-1	84076850

# Low power attenuators, up to 2 Watts

SMA, 50 Ω, connector configuration male to female



Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
6	1.2	20.8	2	1	6601_SMA-50-2	84037361
				2	6602_SMA-50-2	84034481
				3	6603_SMA-50-2	84036311
				4	6604_SMA-50-2	84034272
				5	6605_SMA-50-2	84037414
				6	6606_SMA-50-2	84037343
				7	6607_SMA-50-2	84037410
				8	6608_SMA-50-2	84037388
				9	6609_SMA-50-2	84037381
				10	6610_SMA-50-2	84036452
				15	6615_SMA-50-2	84037424
				20	6620_SMA-50-2	84037362
				30	6630_SMA-50-2	84037372
18	1.35	16.5	2	1	6801.19.A <sup>1)</sup>	22641550
				2	6802.19.A <sup>1)</sup>	22641555
				3	6803.19.A <sup>1)</sup>	22550028
				4	6804.19.A <sup>1)</sup>	22641554
				5	6805.19.A <sup>1)</sup>	22641553
			1	6	6806.19.A <sup>1)</sup>	22550030
				7	6807.19.A <sup>1)</sup>	22641552
				8	6808.19.A <sup>1)</sup>	22641551
				9	6809.19.A <sup>1)</sup>	22641566
				10	6810.19.A <sup>1)</sup>	22550031
				20	6820.19.A <sup>1)</sup>	22550042
				30	6830.19.A <sup>1)</sup>	22550052

<sup>1)</sup> body made of copper beryllium alloy with gold plating and without epoxy captivation for better EMC shielding

# Low power attenuators, up to 2 Watts

SMA, 50  $\Omega$ , connector configuration male to female



Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
18	1.35	16.5	2	1	6601_SMA-50-1	84037360
				2	6602_SMA-50-1	84030799
				3	6603_SMA-50-1	84036313
				4	6604_SMA-50-1	84034265
				5	6605_SMA-50-1	84037413
				6	6606_SMA-50-1	84037341
				7	6607_SMA-50-1	84037409
				8	6608_SMA-50-1	84037387
				9	6609_SMA-50-1	84037379
				10	6610_SMA-50-1	84036459
				15	6615_SMA-50-1	84037421
				20	6620_SMA-50-1	84037363
				30	6630_SMA-50-1	84037371
23	1.4	15.6	2	1	6601_SMA-50-3	84066837
				2	6602_SMA-50-3	84066840
				3	6603_SMA-50-3	84066841
				4	6604_SMA-50-3	84066842
				5	6605_SMA-50-3	84066844
				6	6606_SMA-50-3	84066845
				7	6607_SMA-50-3	84066847
				8	6608_SMA-50-3	84066850
				9	6609_SMA-50-3	84066851
				10	6610_SMA-50-3	84066853
				15	6615_SMA-50-3	84066855
				20	6620_SMA-50-3	84066879
				30	6630_SMA-50-3	84066884

TNC, 50  $\Omega$ , connector configuration male to female



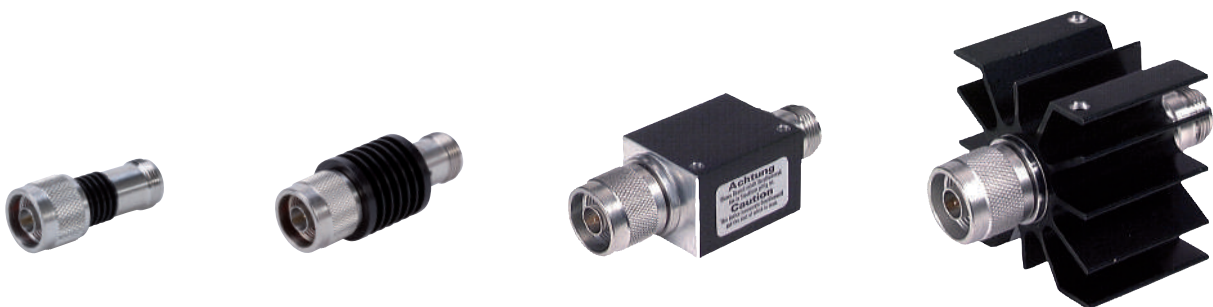
Frequency DC to GHz	VSWR max.	Return loss min. dB	Power rating W	Nom. attenuation dB	HUBER+SUHNER type	Item no.
12.4	1.4	15.6	2	3	6803.26.A	22543746
				6	6806.26.A	22550194
			1	10	6810.26.A	22550195
				20	6820.26.A	22550196
				30	6830.26.A	22550197

# Medium/high power attenuators

N, 50 Ω, connector configuration male to female

Power rating W	Frequency DC to GHz	VSWR max.	Return loss min. dB	Nom. attenuation dB	HUBER+SUHNER type	Item no.
5	6	1.2	20.8	3	5903_N-50-6	84060582
				6	5906_N-50-6	84060587
				10	5910_N-50-6	84060597
				15	5915_N-50-6	84060647
				20	5920_N-50-6	84060649
				30	5930_N-50-6	84060653
10	6	1.25	19.1	3	5903.17.0003	22648036
		1.35	16.5	6	5906.17.0003	22648039
	18	1.4	15.6	3	5903_N-50-010	84060166
				6	5906_N-50-010	84060181
				10	5910_N-50-010	84060182
				20	5920_N-50-010	84060186
				30	5930_N-50-010	84060452
				40	5940_N-50-010	84060453
25	6	1.25	19.1	3	5903.17.0004	22648037
				6	5906.17.0004	22648040
		1.2	20.8	10	5910_N-50-025	84067096
				20	5920_N-50-025	84067101
				30	5930_N-50-025	84067102
50	6	1.25	19.1	3	5903.17.0005	22648038
				6	5906.17.0005	22648041
		1.25	19.1	10	5910_N-50-050*	84067128
				20	5920_N-50-050*	84067127
				30	5930_N-50-050*	84064545

\* unidirectional unit, input port is the male connector



# High power attenuators

N, 50 Ω, connector configuration male to female

Power rating W	Frequency DC to GHz	VSWR max.	Return loss min. dB	Nom. attenuation dB	HUBER+SUHNER type	Item no.
100	6	1.45	14.7	3	5903_N-50-1	84060038
				6	5906_N-50-1	84060058
				10	5910_N-50-1	84060059
				20	5920_N-50-1	84060060
				30	5930_N-50-1	84048317

all units are unidirectional, input port is the male connector



# Medium power attenuators

SMA, 50  $\Omega$ , connector configuration male to female

Power rating W	Frequency DC to GHz	VSWR max.	Return loss min. dB	Nom. attenuation dB	HUBER+SUHNER type	Item no.
5	18	1.35	16.5	3	5903_SMA-50-005	84066683
				6	5906_SMA-50-005	84066745
				10	5910_SMA-50-005	84066751
				20	5920_SMA-50-005	84066757
				30	5930_SMA-50-005	84066762
10	6	1.2	20.8	3	5903.19.0001	22659280
				6	5906.19.0002	22651220
	18	1.35	16.5	3	5903_SMA-50-010	84066939
				6	5906_SMA-50-010	84066946
				10	5910_SMA-50-010	84066948
				20	5920_SMA-50-010	84066949
				30	5930_SMA-50-010	84066962

\* unidirectional unit, input port is the male connector



# Medium power attenuators

7/16, 50 Ω, connector configuration male to female

Power rating W	Frequency DC to GHz	VSWR max.	Return loss min. dB	Nom. attenuation dB	HUBER+SUHNER type	Item no.
10	6	1.25	19.1	3	5903.41.0001	22652689
		1.35	16.5	6	5906.41.0001	22652690
		1.45	14.7	10	5910_716-50-010	84067139
				20	5920_716-50-010	84067141
				30	5930_716-50-010	84067142

\* unidirectional unit, input port is the male connector





## Coaxial terminators



# Coaxial terminators

Low, medium and high power

Product description	18
Low power terminations, up to 2 Watts	
BNC	19
BMA	19
MCX	19
MMCX	20
N	20
NEX10	20
PC2.4	20
QLA	20
QMA	21
QN	21
SK (PC 2.92)	21
SMA	21
SMB	21
SMC	22
TNC	22
4.3-10	23
7/16	23
Medium power terminations, up to 60 Watts	
BNC	24
N	24
SMA	25
TNC	25
7/16	25

# Coaxial terminators

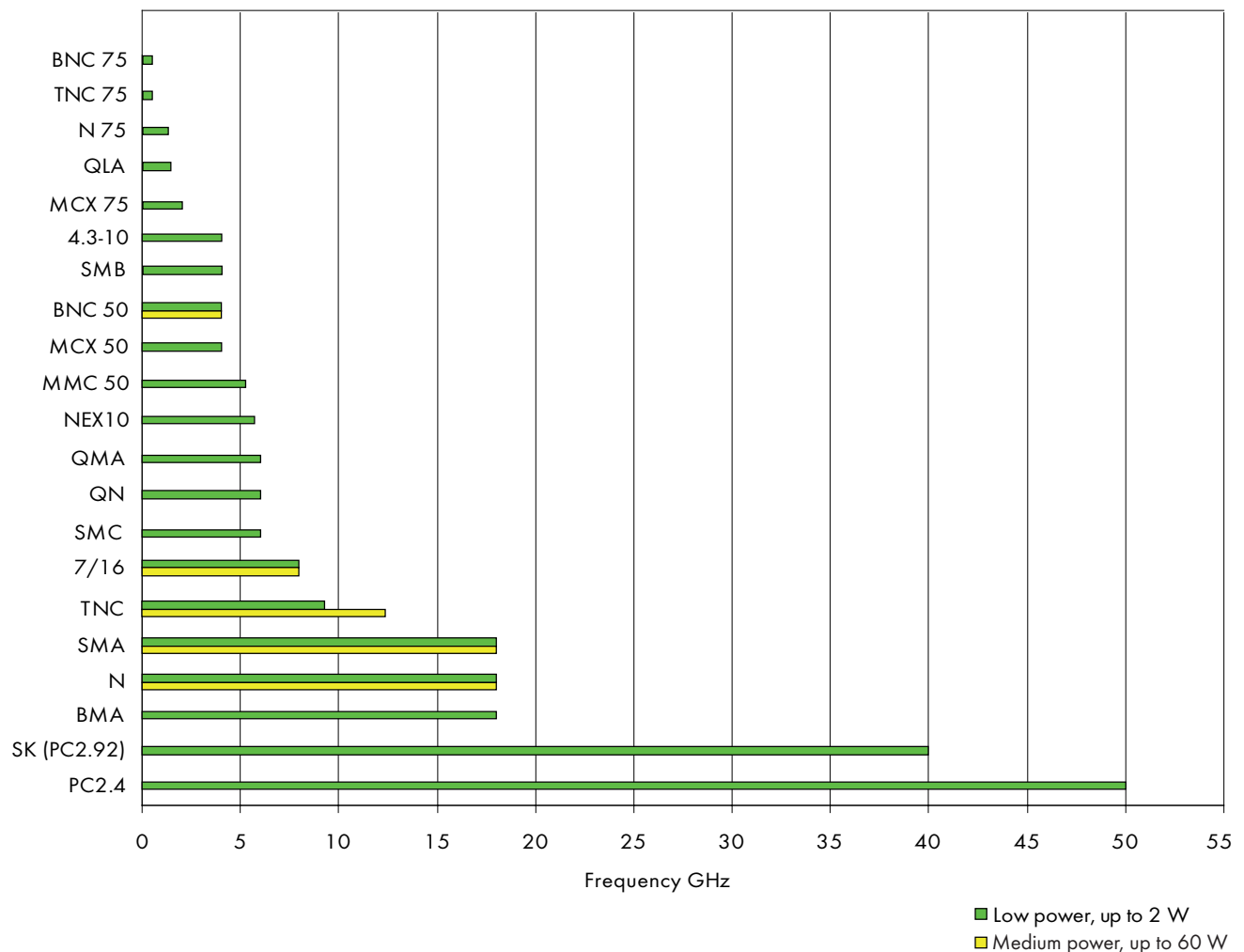
## Product description

Terminators (also called RF loads or dummy loads) are applied to an open end of a transmission line, e.g. an RF port, to prevent the back-reflection of an RF signal. They are used in a large variety of test & measurement, defence and communication applications.

## Features

- Impedance matched
- Standard or precision types
- Various bandwidth
- Low and medium power

## Termination quick selection chart



## Product details

Specific data sheets and outline drawings are available on request or on our website [hubersuhner.com](http://hubersuhner.com).

## Power handling capability

The referenced **average input power rating** is mainly applicable at 25 °C ambient temperature. For higher ambient temperature a certain power derating may be required. Please see detailed product specification. Medium and high power products shall be mounted in such a way that free air convection around heat sink is given to assure performance.

# Low power terminators, up to 2 Watts

## BNC, 50 and 75 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
2	1.2	20.8	1	50 Ω male	65_BNC-50-0-2 <sup>1)</sup>	22550141
				50 Ω female	65_BNC-50-0-35 <sup>1)</sup>	22648680
4	1.15	23.1	1	50 Ω male	65_BNC-50-0-6	84010974
1	1.22	20.1	0.4	75 Ω male	65_BNC-75-0-7	22650006
	1.1	26.4	1	75 Ω male	65_BNC-75-0-1	22550055
	1.1	26.4	1	75 Ω male	65_BNC-75-0-2 <sup>1)</sup>	22550058

<sup>1)</sup> products with chain

## MCX, 50 and 75 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
6	1.22	20.1	1	50 Ω male	65_MCX-50-0-4	85026660
2	1.2	20.8	0.5	50 Ω female	65_MCX-50-0-31	22550163
2	1.3	17.7	0.5	75 Ω male	65_MCX-75-0-1	22649865
				75 Ω female	65_MCX-75-0-31	22650762

## BMA, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
15	1.45	14.7	0.5	female	65_BMA-50-0-2	23031865
18	1.35	16.5	0.5	female	65_BMA-50-0-1	22648598

# Low power terminators, up to 2 Watts

## MMCX, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
6	1.22	20.1	1	male	65_MMCX-50-0-2	85026661
2	1.2	20.8	0.5	female	65_MMCX-50-0-31	22649357

## NEX10, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
6	1.14	24	2	male	65_NEX10-50-0-X1	85113130

## N, 50 and 75 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
2.5	1.22	20.1	1	N 50 Ω male	65_N-50-0-52 <sup>1)</sup>	84016980
4	1.2	20.8	1	N 50 Ω male	65_N-50-0-1	22550091
6	1.15	23.1	1	N 50 Ω male	65_N-50-0-51	23034002
				N 50 Ω male	65_N-50-0-53 <sup>2)</sup>	84025689
18	1.06	30.7	2	N 50 Ω male	6500_N-50-1	84066537
				N 50 Ω female	6500_N-50-2	84066538
	1.25	19	2	N 50 Ω male	65002_N-50-1	84059922
1.3	1.05	32.3	1	N 75 Ω male	65_N-75-0-11	22550107

<sup>1)</sup> products with chain

<sup>2)</sup> waterproof

## PC2.4, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
50	1.6	12.7	0.5	male	6500_PC24-50-1	84066625

# Low power terminators, up to 2 Watts

QLA, 50  $\Omega$



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
1.4	1.22	20.1	1	male	65_QLA-01-0-3	85011311

QMA, 50  $\Omega$



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
6	1.15	23.1	1	male	65_QMA-50-0-2	84011011
				female	65_QMA-50-0-4	23038371
3	1.2	20.8	1	male	65_QMA-W50-0-5 <sup>2)</sup>	84025816

<sup>1)</sup> products with chain  
<sup>2)</sup> waterproof

QN, 50  $\Omega$



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
6	1.15	23.1	1	male	65_QN-50-0-2	84015257

SK (PC2.92), 50  $\Omega$



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
40	1.22	20.1	1	male	6500.42.0001	84000377

# Low power terminators, up to 2 Watts

SMA, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
6	1.15	23.1	1	male	65_SMA-50-0-20 <sup>2)</sup>	84011015
	1.15	23.1		male	65_SMA-50-0-25 <sup>1) 2)</sup>	84028132
	1.15	23.1		female	65_SMA-50-0-35 <sup>2)</sup>	23015765
18	1.1	26.4	0.75	male	6500.19.A	22645868
	1.15	23.1		female	6500.19.B	22645869
	1.25	19.1	1	male	65_SMA-50-0-1 <sup>2)</sup>	22640162
				female	65_SMA-50-0-36	84141417

<sup>1)</sup> products with chain  
<sup>2)</sup> waterproof

SMB, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
4	1.4	15.6	0.5	male	65_SMB-50-0-1	22550111
				female	65_SMB-50-0-31	22640230

SMC, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
4	1.2	20.8	0.5	female	65_SMC-50-0-31	22550114
6	1.22	20.1	1	male	65_SMC-50-0-2	84011016

# Low power terminators, up to 2 Watts

TNC, 50 and 75 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
2	1.2	20.8	1	50 Ω male <sup>1)</sup>	65_TNC-50-0-5	22659509
				50 Ω female	65_TNC-50-0-31	22640683
6	1.15	23.1	1	50 Ω male	65_TNC-50-0-6	84011017
1	1.1	26.4	1	75 Ω male	65_TNC-75-0-1	22543883

<sup>1)</sup> product with chain

4.3-10, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
4	1.1	20.8	2	male	65_4310-50-0-X1	85096478
4	1.1	20.8	2	male	65_4310-50-0-Z1	85088548

X: torque Z:quick-lock

7/16, 50 Ω



Frequency GHz	VSWR max.	Return loss min. dB	Power rating W	Interface characteristics	HUBER+SUHNER type	Item no.
2	1.2	20.8	1	male	65_716-50-0-3	22652596
8	1.1	26.4	1	female	6500.41.B	22650017
				male	6500.41.A	22650018
4	1.2	20.8	2	male	65_716-50-0-2	22648281

# Medium power terminators, up to 60 Watts

BNC, 50  $\Omega$



Power rating W	Frequency GHz	VSWR max.	Return loss min. dB	Interface characteristics	HUBER+SUHNER type	Item no.
6	4	1.1	26.4	male	6506.01.A	22550260
				female	6506.01.B	22550259
15	4	1.1	26.4	male	6515.01.A	22550273



N, 50  $\Omega$

Power rating W	Frequency GHz	VSWR max.	Return loss min. dB	Interface characteristics	HUBER+SUHNER type	Item no.
6	6	1.25	19.1	male	6506.17.0001	22659464
				female	6506.17.B	22550253
	12.4	1.25	19.1	male	6506.17.A	22550258
10	6	1.2	20.8	male	65010_N-50-1	84047978
				female	65010_N-50-4	84068990
	18	1.4	15.6	male	65010_N-50-3	84066518
				female	65010_N-50-2	84068982
15	12.4	1.25	19.1	male	6515.17.A	22550264
				female	6515.17.B	22550263
25	2	1.1	26.4	male	6525.17.AB	22643785
				female	6525.17.BB	22643787
	5	1.2	20.8	male	6525.17.AA	22642248
				female	6525.17.BA	22643786
	6	1.2	20.8	male	65025_N-50-1	84059933
				female	65025_N-50-2	84059934
50/25*	2	1.1	26.4	male	6550.17.AB	22643791
				female	6550.17.BB	22643793
	5	1.2	20.8	male	6550.17.AA	22641938
				female	6550.17.BA	22643792
60	2	1.1	26.4	male	6560.17.AB	22643799
				female	6560.17.BB	22643801
	5	1.2	20.8	male	6560.17.AA	22643798
				female	6560.17.BA	22643800

\* 50 Watt, if the termination is mounted on an additional heat sink with a max. thermal resistance ( $R_{th}$ ) of 5 K/Watt. Without additional heat sink this termination is applicable up to 25 Watts only.



# Medium power terminators, up to 60 Watts

SMA, 50  $\Omega$



Power rating W	Frequency GHz	VSWR max.	Return loss min. dB	Interface characteristics	HUBER+SUHNER type	Item no.
5	18	1.25	19.1	male	65005_SMA-50-1	84066544
6	12.4	1.25	19.1	male	6506.19.0001	22659462
		1.25	19.1	male	6506.19.A	22550257
		1.25	19.1	female	6506.19.B	22550256
10	18	1.4	15.6	male	65010_SMA-50-1	84066618
15	12.4	1.25	19.1	male	6515.19.A	22544579
				female	6515.19.B	22544580

TNC, 50  $\Omega$



Power rating W	Frequency DC to GHz	VSWR max.	Return loss min. dB	Interface characteristics	HUBER+SUHNER type	Item no.
6	6	1.25	19.1	male	6506.26.0002	22649996
	12.4	1.3	17.7	male	6506.26.A	22550255

7/16, 50  $\Omega$



Power rating W	Frequency DC to GHz	VSWR max.	Return loss min. dB	Interface characteristics	HUBER+SUHNER type	Item no.
6	8	1.2	20.8	male	6506.41.A	22550272
				female	6506.41.B	22550271
10	4	1.2	20.8	male	65010_716-50-1	84048315
15	8	1.2	20.8	male	6515.41.A	22544577
				female	6515.41.B	22544578
25	2	1.1	26.4	male	6525.41.AB	22643788
				female	6525.41.BB	22643790
	5	1.2	20.8	male	6525.41.AA	23007076
50/25*	2	1.1	26.4	male	6550.41.AB	22643795
				female	6550.41.BB	22643797
60	2	1.1	26.4	male	6560.41.AB	22643803
				female	6560.41.BB	22643805
	5	1.2	20.8	male	6560.41.AA	23008377
				female	6560.41.BA	23010487

\* 50 Watt, if the termination is mounted on an additional heat sink with a max. thermal resistance ( $R_{th}$ ) of 5 K/Watt. Without additional heat sink this termination is applicable up to 25 Watts only.



Miscellaneous components

# Miscellaneous components

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# Feed through terminators

Feed through terminations are designed to connect 50 Ω transmission lines or RF devices with a high impedance test equipment, e.g. oscilloscope.

## Features

- Allows high input impedance RF measurement



## 50 Ω, connector configuration male to female

Interface characteristics	Frequency DC to GHz	VSWR max.	Return loss min. dB	Power W	HUBER+SUHNER type	Item no.
BNC	0.5	1.25	19.1	2	6701.01.A	22543741
BNC	1	1.25	19.1	0.4	6701.01.B	22543742
N	0.5	1.25	19.1	0.4	6701.17.A	22644916

# DC blocks

A DC block separates or blocks DC voltage (galvanic isolation) and let pass RF frequency along a coaxial transmission line.

## Features

- Broadband
- RF signal passes with negligible loss
- Blocking of DC
- Galvanic isolation of centre conductor



## 50 Ω, connector configuration male to female

Interface characteristics	Frequency GHz	Voltage max. V	Block type	VSWR max.	Return loss min. dB	HUBER+SUHNER type	Item no.
BNC	5	250	centre conductor	1.22	20.1	1100.01.A	22550233
N	5	250	centre conductor	1.22	20.1	1100.17.A	22550232
SMA	18	200	centre conductor	1.35	16.5	1100.19.0001	84107082

Detailed product specifications and outline drawings are available on request.

# Impedance matching pads

Matching pads are designed to match 50 Ω with 75 Ω impedance of two different transmission lines of while preserving signal integrity.

## Features

- Low insertion loss
- High repeatability
- Low return loss



## 50 Ω with 75 Ω

Interface characteristics	Frequency GHz	VSWR max. at 50 Ω	Return loss min. dB	Power W	HUBER+SUHNER type	Item no.
BNC: 50(m) - 75(f)	1	1.25	19.1	0.7	6001.01.A	22543737
BNC: 50(f) - 75(m)	1	1.25	19.1	0.7	6001.01.B	22550085
N: 50(f) - 75(m)	1	1.25	19.1	0.7	6001.17.B	22642806
N: 50(m) - 75(f)	1	1.25	19.1	0.7	6001.17.A	22642807
N: 50(m) - BNC 75(f)	1	1.25	19.1	0.7	6001.00.0001	22649583

m: refers to male, f: refers to female

# Resistive power dividers

Power dividers are designed to split a RF signal equally into two output signals with an insertion loss of 6 dB.

## Features

- Broadband down to DC
- Very low return loss
- Cost effective solution to tap off a signal
- Very compact

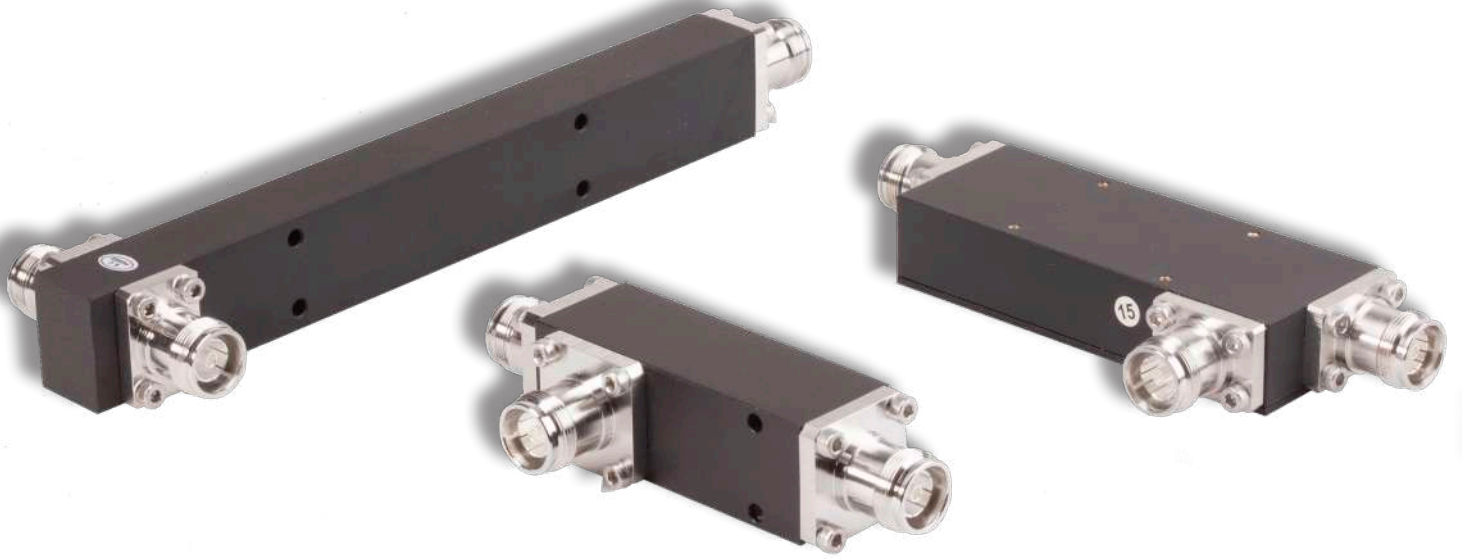


## 50 Ω

Interface characteristics	Frequency GHz	VSWR max.	Return loss min. dB	Power W	HUBER+SUHNER type	Item no.
BNC (f-f-f)	2	1.15	23.1	1	4901.01.A	22550077
BNC (m-f-f)	2	1.15	23.1	1	4901.01.B	22550078
N (f-f-f)	2	1.15	23.1	1	4901.17.A	22550252
N (m-f-f)	2	1.15	23.1	1	4901.17.B	22643830
SMA (f-f-f)	12.4	1.2	20.8	0.5	4901.19.A	22641657

m: refers to male, f: refers to female

Detailed product specifications and outline drawings are available on request.



Signal combining

# Signal combining

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## Multiplexers/Filters



HUBER+SUHNER type	Item no.	Interface (female)	Frequency (MHz)		PIM < (dBc)	Comment
			Low band	High band		
2501.17.0092	84103626	N	80 to 960	1695 to 2700	-155	TETRA + cellular + WiFi diplexer
2501.17.0094	85029272	N	80 to 2170	2400 to 2500	-153	WiFi 2.4 GHz injector
2501.17.0095	85029273	N	80 to 2690	3300 to 5850	-150	WiFi 5 GHz injector
2501.17.0097	85029235	N	80 to 2170	2400 to 2500 4900 to 5850	-161	WiFi 2.4 + 5 GHz injector
7501.17.001	84045218	N	80 to 2170	2400 to 2500	-153	WiFi 2.4 injector

HUBER+SUHNER type	Item no.	Interface (female)	Frequency (MHz)				Comment
			Band 1	Band 2	Band 3	Band 4	
2501.41.0100	85070953	7/16	380 to 960	1710 to 1880	1920 to 2170	2500 to 2690	TETRA + GSM/ UMTS, LTE

## Hybrid and matrix couplers



HUBER+SUHNER type	Item no.	Interface (female)	Frequency (MHz)	PIM < (dBc)	Coupling (dB)	Comment
7404.17.0003	84115336	N	694 to 2700	-161	3	2 × 2
7404.31.0001	85078458	4.3-10	694 to 2700	-161	3	2 × 2
7406.17.0002	85029248	N	694 to 2700	-161	4.8	3 × 3



# Power splitters



HUBER+SUHNER type	Item no.	Interface (female)	Frequency (MHz)	PIM < (dBc)	Remarks	Split loss (dB)
5501.17.0030	85029258	N	380 to 2700	-155	2 way	3
5501.17.0031	85029259	N	380 to 2700	-155	3 way	4.8
5501.41.0030	85029262	7/16	380 to 2700	-155	2 way	3
5502.17.0050	85029265	N	694 to 3800	-161	2 way	3
5502.41.0050	85029268	7/16	694 to 3800	-161	2 way	3
5501.31.0020	85075304	4.3-10	380 to 2700	-161	2 way	3
5501.31.0030	85075306	4.3-10	380 to 2700	-161	3 way	4.8
5501.31.0040	85075307	4.3-10	380 to 2700	-161	4 way	6
5504.17.0009	85078528	N	2000 to 6000		2 way	3
5502.19.0004	22650303	SMA female/male	2000 to 2500		2 way	3

## Directional couplers



HUBER+SUHNER type	Item no.	Interface (female)	Frequency (MHz)	PIM < (dBc)	Coupling (dB)
7215.31.0001	85075255	4.3-10	694 to 2700	-161	15
7206.31.0002	85075253	4.3-10	694 to 2700	-161	6
7210.31.0003	85075254	4.3-10	694 to 2700	-161	10
7220.31.0004	85075256	4.3-10	694 to 2700	-161	20

Directivity typ.  $\geq 20$  dB

## Tappers



HUBER+SUHNER type	Item no.	Interface (female)	Frequency (MHz)	PIM < (dBc)	Inequality between outputs	Ratio between outputs (dB)
5501.31.0002	85075310	4.3-10	350 to 2700	-161	2:1 (3 dB)	-1.8/-4.8
5501.31.0003	85075311	4.3-10	350 to 2700	-161	3:1 (4.8 dB)	-1.3/-6.1
5501.31.0004	85075312	4.3-10	350 to 2700	-161	4:1 (6.0 dB)	-1/-7
5501.31.0010	85075315	4.3-10	350 to 2700	-161	10:1 (10 dB)	-0.4/-10.4
5501.31.0015	85075316	4.3-10	350 to 2700	-161	30:1 (15 dB)	-0.1/-15.1
5501.31.0100	85075317	4.3-10	350 to 2700	-161	100:1 (20 dB)	-0.1/-20.1

# Wilkinson dividers



HUBER+SUHNER type	Item no.	Interface (female)	Frequency (MHz)	PIM < (dBc)	Remarks	Split loss (dB)
5501.17.0027	84104565	N	380 to 2700	-	2 way	3
5502.17.0030	84104570	N	694 to 2700	-	2 way	3
5502.17.0032	84104573	N	694 to 2700	-	4 way	6
5502.17.0060 *	85015454	N	698 to 2700	-	2 way	3

\*Wilkinson Splitter with one DC path blocked

# High power Low PIM Loads for stationary use

HUBER+SUHNER developed a stepped portfolio of compact Low PIM Loads starting at 30 Watt up to 150 Watt. This provides the flexibility and freedom you need for designing a DAS network. The modularity accommodates economics without compromising quality and performance.

## Application

In a high power wireless infrastructure, the deployment of low PIM components is crucial in regards to the mobile network's availability and service quality.



## Low PIM loads, 50 Ω

HUBER+SUHNER type	Item no.	Interface	Frequency (GHz)	Power (W)	PIM (dBc) <sup>1)</sup>
6530.17.0001	85032246	N female	0.69 to 2.7	30	≤ -160 (typ. -165)
6530.41.0001	85032253	7/16 female	0.69 to 2.7	30	≤ -160 (typ. -165)
6530.31.0001	85099304	4.3-10 female	0.35 to 4.0	30	≤ -160 (typ. -165)
6560.31.0001	85105095	4.3-10 female	0.35 to 4.0	60	≤ -160 (typ. -165)
65100.31.0001	85105101	4.3-10 female	0.35 to 4.0	100	≤ -160 (typ. -165)
65150.31.0001	85105102	4.3-10 female	0.35 to 4.0	150	≤ -160 (typ. -165)

<sup>1)</sup> Two-tone test at 2 x 43 dBm / 2 x 20 W carrier

# Adaptors

These low PIM adaptors have been specially developed for IBC/DAS/small cell grade applications where passive intermodulation requirements are crucial.



## Intermodulation adaptors, 50 Ω

Interface 1	Interface 2	PIM (dBc) <sup>1)</sup>	HUBER+SUHNER type	Item no.
7/16 male	NEX10 female	≤ -166 **	33_716-NEX10-50-1/133_WE	85092476
NEX10 male	7/16 female	≤ -166 **	33_NEX10-716-50-X1/133_WE	85092478
4.3-10 male	7/16 male	≤ -155 *	32_4310-716-50-X2/133_WE	85031321
4.3-10 male	7/16 female	≤ -155 *	33_4310-716-50-X2/133_WE	85031408
7/16 male	4.3-10 female	≤ -155 *	33_716-4310-50-2/133_WE	85031552
7/16 female	7/16 female	≤ -155 *	31_716-50-0-5/133_WE	85031221
7/16 male	7/16 male	≤ -155 *	32_716-50-0-5/133_WE	85031354
7/16 male	7/16 female	≤ -155 *	33_716-50-0-5/133_WE	85031578
N female	7/16 female	≤ -155 *	31_N-716-50-4/133_WE	85031263
N male	7/16 male	≤ -155 *	32_N-716-50-5/133_WE	85026230
7/16 male	N female	≤ -155 *	33_716-N-50-9/133_WE	85026231
N male	7/16 female	≤ -155 *	33_N-716-50-5/133_WE	85031611

<sup>1)</sup> Two-tone test at 2 x 43 dBm / 2 x 20 W carrier

\* typ. -160 dBc

\*\* typ. -171 dBc



## Low PIM T+M components

# Low PIM T+M components

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# Low passive intermodulation loads

HUBER+SUHNER offers high performance intermodulation loads for test & measurement in multicarrier high RF power radio applications. They are primarily used to terminate open transmission lines in PIM sensitive applications such as an open port of a hybrid coupler. These intermodulation loads are made by using high performance material, especially selected to obtain the best PIM and VSWR results.

## Features

- High stability
- High repeatability
- Outstanding low PIM levels (better than  $-160$  dBc)
- Other power levels and customized designs available on request



## Low PIM loads, 50 $\Omega$

HUBER+SUHNER type	Item no.	Interface	Frequency (GHz)	Power (W)	PIM (dBc) <sup>1)</sup>
6510.31.0002	85089827	4.3-10 female	0.4 to 3.8	10, 40 *	$\leq -160$ (typ. $-165$ )

<sup>1)</sup> Two-tone test at  $2 \times 43$  dBm /  $2 \times 20$  W carrier

\* RF power handling 10 W continuous or 40 W for max 3 min periodic at an ON:OFF ratio of 1:3;

Detailed product specifications and outline drawings are available on request or on our website [hubersuhner.com](http://hubersuhner.com).



# Low passive intermodulation adaptors

These low PIM adaptors have been specially developed for T+M grade applications in intermodulation test set-ups in the field where passive intermodulation requirements are crucial.

## Features

- Outstanding intermodulation performance
- Non magnetic materials
- Excellent electrical contacts
- Reliable and repeatable intermodulation measurements



## Intermodulation adaptors, 50 Ω

Interface 1	Interface 2	PIM (dBc) <sup>1)</sup>	Frequency (GHz)	HUBER+SUHNER type	Item no.
7/16 female	7/16 female	≤ -165	2.7	31_716-50-0-2/133_WE	22658136
7/16 male	7/16 male	≤ -165		32_716-50-0-2/133_WE	22658141
7/16 male	7/16 female	≤ -165		33_716-50-0-2/133_WE	22658193
7/16 female	N female	≤ -165	2.7	31_N-716-50-2/133_WE	22658137
7/16 male	N male	≤ -165		32_N-716-50-2/133_WE	22658140
7/16 male	N female	≤ -165		33_716-N-50-3/133_WE	22658823
7/16 female	N male	≤ -165		33_N-716-50-3/133_WE	22658217
7/16 female	QN female	≤ -155	2.7	31_QN-716-50-1/113_WE	23033269
7/16 male	QN male	≤ -155		32_QN-716-50-1/113_WE	23033643
7/16 male	QN female	≤ -155		33_716-QN-50-1/113_WE	23033644
7/16 female	QN male	≤ -155		33_QN-716-50-1/113_WE	23033550
7/16 female	4.1/9.5 female	≤ -165	2.7	31_4195-716-50-1/113_WE	22658138
7/16 male	4.1/9.5 male	≤ -165		32_4195-716-50-1/113_WE	85024384
7/16 male	4.3-10 male	≤ -166	2.7	32_4310-716-50-x1/113_WE	85017233
7/16 female	4.3-10 female	≤ -166		33_4310-716-50-x1/113_WE	85017237
7/16 male	4.3-10 female	≤ -166		33_716-4310-50-x1/113_WE	85017213

<sup>1)</sup> Two-tone test at 2 x 43 dBm / 2 x 20 W carrier

# Passive intermodulation standards

Intermodulation standards are special adaptors which generates intermodulation products of a certain preset level. They are used to verify intermodulation test benches for an instant and/or long-term level stability monitoring. If the third-order intermodulation value, displayed by the test instrument, deviates from the specified value of the intermod standard, it indicates a general measurement uncertainty which may be caused by the test setup rooting in one or several component or interconnection PIM sources.

## Features

- High repeatability
- Each item delivered with measurement protocol
- Verification traceability via serial number



## 7/16, 50 Ω, connector configuration male to female

Frequency band MHz	PIM (dBc) <sup>1)</sup> 3rd order intermodulation <sup>2)</sup>	HUBER+SUHNER type	Item no.
900	-80	69_716-50-0-1/133_WE	22658219
900	-110	69_716-50-0-3/133_WE	22658221
1800	-80	69_716-50-0-5/133_WE	23003870
1800	-110	69_716-50-0-7/133_WE	23003872

<sup>1)</sup> Two-tone test at 2 x 43 dBm / 2 x 20 W carrier

<sup>2)</sup> IM3 ± 3 dB

Detailed product specifications and outline drawings are available on request or on our website [hubersuhner.com](http://hubersuhner.com).



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