

## BP-1M0\_30M

### Bandpass Filter Module 1 MHz ... 30 MHz with Surge Arrester and Level Limiter

#### Features

- compact and rugged design
- effective VLF and VHF/UHF signal suppressions
- high linearity
- integrated level limiter and lightning protection
- easy mountable on N type connectors



#### Applications

- Shortwave reception
- radio monitoring
- direction finding

#### Scope

Filter module BP-1M0\_30M is foreseen in short wave applications in combination with the wideband multicouplers of the WSDU series and switching matrices of the RSWM series from Becker Nachrichtentechnik.

With help of the filter module unwanted out-of-short wave band signals like local broadcast signals can be effectively suppressed.

The module includes a surge arrester for lightning protection, a bandpass filter and a level limiter to protect following devices against over voltages coming from antennas.

The design of the filter module offers high intercept point properties to avoid degradation of linearity in signal path.

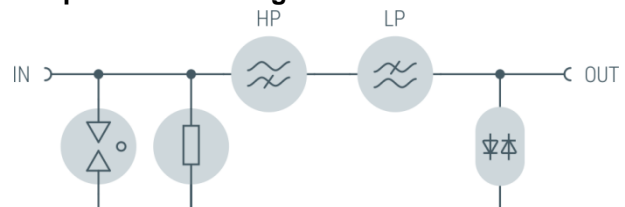
The filter module has N female connector as input and N male connector as output.

The filter is easily mountable on N type RF input connectors of devices.

#### Other frequency ranges

Further filter modules with other pass band frequencies are available in the same form factor. All filter types are listed below in the table related products.

#### Simplified Block Diagram



## RF Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{in} / Z_{out}$		50		Ohm	
low frequency	$f_{min}$			1	MHz	
high frequency	$f_{max}$	30	32		MHz	
insertion loss	$S_{21}$	-3	-1		dB	$f < 1.1$ MHz
	$S_{21}$	-2	-0.5		dB	$f \geq 1.1$ MHz
return loss	$S_{11}, S_{22}$		-20	-10	dB	$f < 1.1$ MHz
	$S_{11}, S_{22}$		-18	-13	dB	$f \geq 1.1$ MHz
2 <sup>nd</sup> order intercept	$OIP2^1$	+65	+77		dBm	
3 <sup>rd</sup> order intercept	$OIP3^2$	+27	+30		dBm	$f < 2.5$ MHz
	$OIP3^2$	+37	+43		dBm	$f \geq 2.5$ MHz
limiter level	$P_{LIM}$		+17		dBm	
maximum DC voltage	$U_{DC}$			20	V	
ESD discharge resistor	$R_{ESD}$		100		k $\Omega$	RF input
filter suppressions	$S_{21}$		-30	-23	dB	$f \leq 800$ kHz, rel. 16 MHz
	$S_{21}$		-45	-25	dB	$80 \text{ MHz} \leq f < 200 \text{ MHz}$ , rel. 16 MHz
	$S_{21}$		-65	-50	dB	$200 \text{ MHz} \leq f \leq 1 \text{ GHz}$ , rel. 16 MHz
surge arrestor voltage			90		V	
input power	$P_{RF IN}$			+25	dBm	
RF connectors	$X_{RF IN}$	N female				
	$X_{RF OUT}$	N male				

Note 1: measured with 2x 0 dBm at 1.1/1.6, 2.7/5.3, 4.5/8.8, 7.8/15.8, 15.9/30.0 MHz

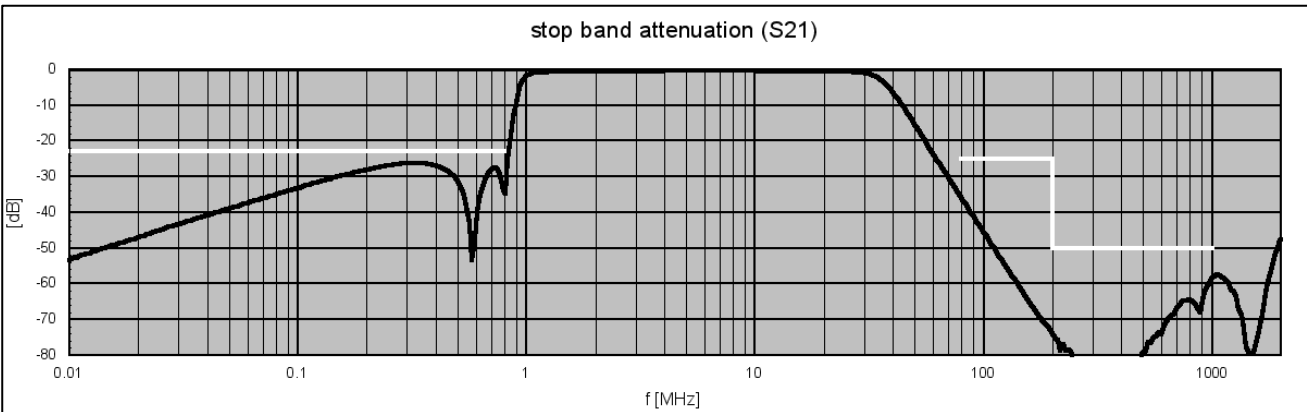
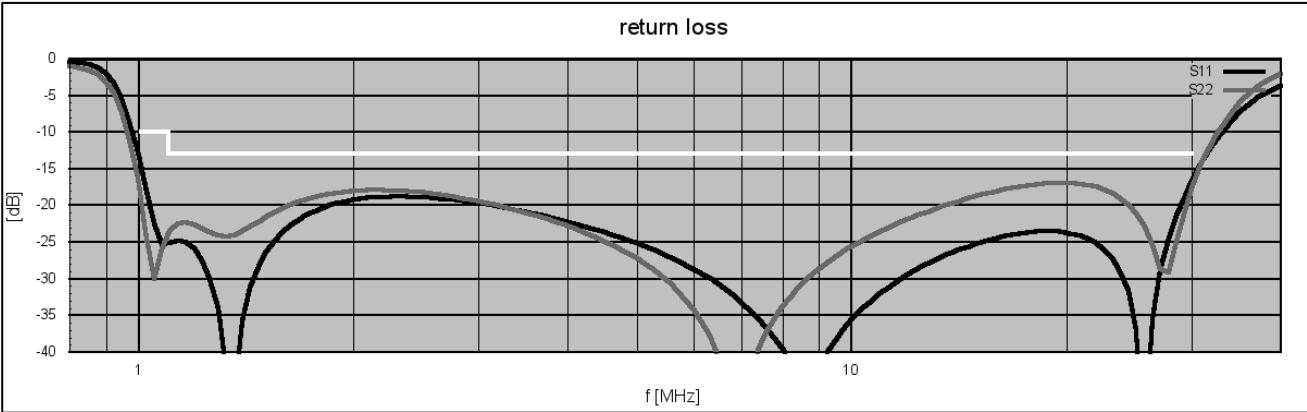
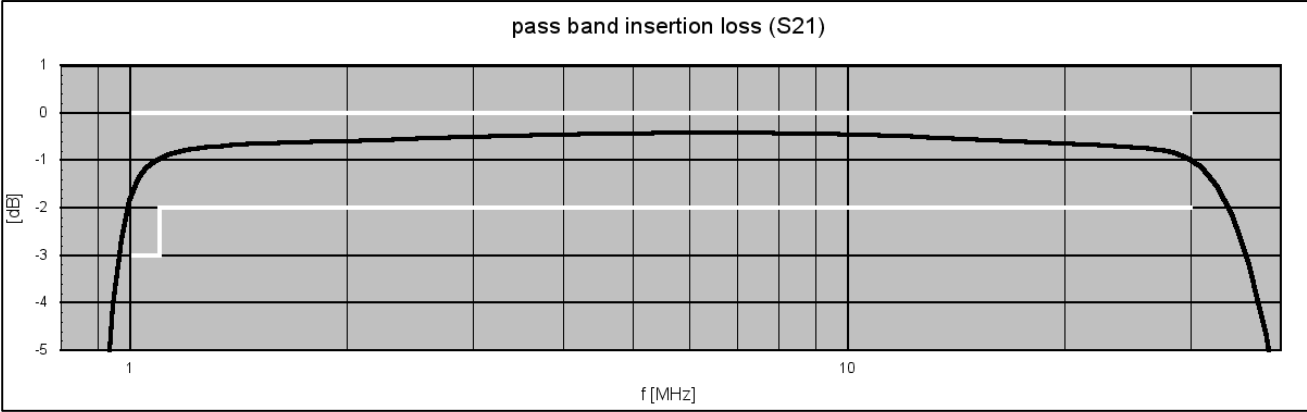
Note 2: measured with 2x 0 dBm at 1.0/1.1, 1.95/2.05, 2.49/2.55, 4.95/5.05, 9.95/10.05, 19.95/20.05, 29.95/30.05 MHz

## Common Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
dimensions	W x H x D	approx. 38 x 26 x 133			mm	including RF connectors
weight	m		170		g	
operating temp. range	$T_o$	+5		+45	$^{\circ}\text{C}$	
storage temp. range	$T_s$	-40		+70	$^{\circ}\text{C}$	
ordering information	BP-1M0_30M		P/N: 1502.6311.1			



S-Parameters (typical response)



**Appearances**



Side view



RF\_IN connector side



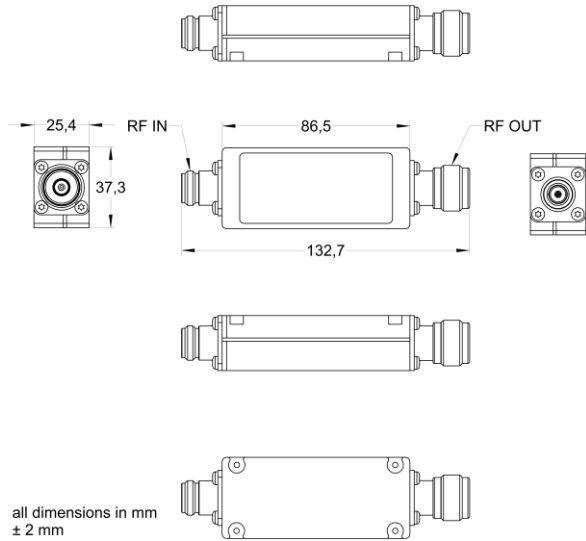
RF\_OUT connector side

**Mounting Example**

The band pass filters are easily mountable on the RF\_IN sockets of multicouplers or switching matrices.



**Dimensions**



**Related Products (Filter Types)**

Product	P/N	Description
BP-0M5_30M	1502.6301.1	Band Pass Filter Module 0.5 ... 30 MHz 90 V surge arrestor and 100 kΩ ESD resistor to GND at input, level limiter Stop band rejections: 30 dB typ. $f < 400$ kHz, 45 dB typ. $80 \text{ MHz} \leq f \leq 1 \text{ GHz}$ , N RF connectors (male / female)
BP-1M0_30M	1502.6311.1	Band Pass Filter Module 1.0 ... 30 MHz 90 V surge arrestor and 100 kΩ ESD resistor to GND at input, level limiter Stop band rejections: 30 dB typ. $f < 800$ kHz, 45 dB typ. $80 \text{ MHz} \leq f \leq 200 \text{ MHz}$ , N RF connectors (male / female)
BP-1M7_30M	1502.6321.1	Band Pass Filter Module 1.7 ... 30 MHz 90 V surge arrestor and 100 kΩ ESD resistor to GND at input, level limiter Stop band rejections: 30 dB typ. $f < 1.3 \text{ MHz}$ , 45 dB typ. $80 \text{ MHz} \leq f \leq 200 \text{ MHz}$ , N RF connectors (male / female)
LP-30M	1107.6301.1	30 MHz Low Pass Filter Module Passband DC...30 MHz 90 V surge arrestor and 100 kΩ ESD resistor to GND at input, level limiter Stop band rejections: 45 dB typ. $80 \text{ MHz} \leq f \leq 200 \text{ MHz}$ , N RF connectors (male / female)

The filters are foreseen in combination with the following multicouplers and switching matrices

Product	P/N	Description
WSDU-2X4R	1107.6202.x	High Dynamic 2 Section 4 Way Multicoupler 10 kHz ... 4000 MHz
WSDU-1X8R	1107.6102.x	High Dynamic 8 Way Multicoupler 100 kHz ... 4000 MHz
WSDU-1X8SR	1502.6102.x	High Dynamic 1X8 Shortwave Signal Distribution 300 kHz...30 MHz
RSWM-4X4R	1205.4102.2	Non-blocking 4X4 Switching Matrix 100 kHz ... 4000 MHz

